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IDENTIFICATION OF CONSTITUENTS OF POTENTIAL CONCERN AND EXPOSURE ASSESSMENT HUMAN HEALTH BASELINE RISK ASSESSMENT TECHNICAL MEMORANDUM LCP CHEMICALS SITE, BRUNSWICK GEORGIA OPERABLE UNIT 2	
Date:	October 19, 2020
To:	Mr. Robert Pope, U.S. EPA Region IV, Superfund Senior Remedial Project Manager
From:	Kirk Kessler P.G., EPS a Montrose Environmental Group Company
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Executive Summary

This technical memorandum was prepared by Environmental Planning Specialists, Inc. ("EPS") on behalf of LCP Steering Committee and presents the initial elements in the development of the Human Health Baseline Risk Assessment ("HHBRA") for LCP Chemicals Operable Unit 2 ("OU2"), namely the identification of Constituent of Potential Concern ("COPC") and the Exposure Assessment which will form the basis for the computational risk assessment. OU2 addresses groundwater beneath the LCP Site and includes the subsurface within the former chlor-alkali cell building area ("CBA"). COPCs were developed according to standard protocols of the U.S. Environmental Protection Agency ("EPA") Risk Assessment Guidance ("RAGS" for Superfund (EPA, 2018) which are inherently conservative, such that potentially important contributors to risk are carried forward.

The Exposure Assessment considers practical aspects of the site setting along with current and anticipated future uses of the property, consistent with recognized property use constraints in EPA's determination of the Record of Decision ("ROD") for Operable Unit 3 (upland soils) recently concluded.

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ACRONYMS AND ABBREVIATIONS

ADD	Average Daily Dose
amsl	above mean sea level
AOC	Administrative Order by Consent
Arco	Atlantic Richfield Company
CBA	Cell Building Area
CBASI	Cell Building Area Subsurface Investigation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Constituent of Potential Concern
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
EPS	Environmental Planning Specialists, Inc.
EU	Exposure Unit
Fm	Formation
Ft-bgs	Feet below ground surface
HHBRA	Human Health Baseline Risk Assessment
HQ	Hazard Quotient
LADD	Lifetime Average Daily Dose
Mbr	Member
OU2	Operable Unit 2
PAH	Polyaromatic Hydrocarbon
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RP	Responsible Party
RSL	Regional Screening Level
Site	LCP Chemicals Superfund Site
TM	Technical Memorandum
UCL	Upper Confidence Limit

1 INTRODUCTION

This Technical Memorandum ("TM") was prepared by Environmental Planning Specialists, Inc. ("EPS") on behalf of LCP Steering Committee represented by Honeywell (formerly AlliedSignal, Inc.) and the Atlantic Richfield Company ("Arco") which are Responsible Parties ("RPs") to an Administrative Order by Consent ("AOC") EPA Docket No.: 95-17-C for the LCP Chemical Site Superfund Site located at 4125 Ross Road, Brunswick, Glynn County, Georgia (the "Site"). This TM addresses the early components of the Human Health Baseline Risk Assessment ("HHBRA") for Operable Unit Two ("OU2") which comprises the Site-wide groundwater and the subsurface of the former chlor-alkali cell building area ("CBA"). Specifically, the TM delivers the results of the screening of the database for Site-wide groundwater and CBA soil for identification of Constituents of Potential Concern ("COPC"), as well as the Exposure Assessment which will formulate the basis for the computational representation of risk.

OU2 characterization studies and monitoring have occurred under the AOC dating back to 1994. A *Site Characterization Summary Report* providing a comprehensive summary of these investigations was submitted to the agencies in late January 2020 with a revision in July 2020 (EPS 2020a, b), and was subsequently approved by the EPA on August 14, 2020. As an outcome of this process, an additional round of focused groundwater monitoring was performed in August 2020 in support of the upcoming Remedial Investigation ("RI") Report. The results of the August 2020 groundwater monitoring event are included in the current COPC screening.

2 BACKGROUND

2.1 Site Setting

The Site property occupies approximately 813 acres immediately northwest of the City of Brunswick, Glynn County, Georgia. Tidal marshland comprises about 670+ acres. The primary upland area, where manufacturing operations at the LCP facility occurred, is located on approximately 133.5 acres of upland area, east of the marsh and bordered by county operations to the north, Ross Road to the east, the Turtle River and associated marshes to the west, and Brunswick Cellulose to the south (Figure 1).

2.2 Site Geology

2.2.1 Surficial Zone (Pliocene to Upper Miocene Formations)

The uppermost portion of the sedimentary deposits underlying the Site is comprised of the Satilla Formation ("Fm."), which is Holocene to Upper Miocene in age. The Satilla Fm. is underlain by the Ebenezer Fm. (previously referenced as the Coosawhatchie Fm.) which is middle Miocene in age. The Ebenezer Fm. replaced the Coosawhatchie designation in recent reporting of Georgia Geological Survey Information Circulars, publications by the U.S. Geological Survey, and reporting by engineering consultants (Steele and McDowell, 1998; Leeth, 1999; Weems and Edwards, 2001; Gill, 2001; Radtke, 2001; Clarke, 2003; Cherry et al., 2011; Gill et al., 2011).

The Satilla Fm. is perched atop a variably-cemented sandstone layer (Ebenezer Member ("Mbr.") #5) present at approximately 50 feet below ground surface ("ft-bgs"). The Satilla Fm. is characterized by two vertically stacked members with distinct lithology. The upper Satilla is a well-sorted sand that gradually and cyclically coarsens from very-fine to medium grain size with depth. Discontinuous thin beds and laminations of silty clay are present in some places in the upper Satilla Fm. The upper Satilla ranges in thickness from 30 to 40 ft over most of the Site but becomes thinner in regions near the marsh edge. The lower Satilla member is a complex, very dense lithologic sequence with considerable lateral and vertical variability. Lithologies range from massive, high plasticity clay to silty clayey sands to well-sorted coarse sand with shells. The lower Satilla member varies irregularly in thickness, ranging from around 12 to 14 ft thick in the northeastern part of the Site to around 2 to 4 ft thick in the southeastern part of the Site. The lower Satilla is characterized by notably denser sediments serving as a semi-confining layer where present. The Satilla Fm. is monitored by the network of 'A', 'B', and 'C' vertical monitoring wells.

The top of the Ebenezer Fm. is identified by a variably-cemented sandstone layer (Ebenezer Mbr. #5) encountered at a depth of approximately 50 ft-bgs. The sandstone is strongly to weakly cemented and contains a matrix of silica, dolomite, and phosphate cements. The layer acts hydraulically as a semi-confining unit. The water-bearing zone underlying the cemented sandstone

layer (Ebenezer Mbrs. #4/#3) consists primarily of medium gray sand with lesser amounts of greenish-gray silt. The sand is typically fine to medium-grained, slightly silty, and well sorted. The total thickness of the #4/#3 Mbr. ranges from approximately 34 to 61 ft. This zone is monitored by the network of 'D' vertical monitoring wells and the 'HW' horizontal monitoring wells.

A marlstone (fuller's earth) confining layer comprises Ebenezer Mbr. #2, at a depth of approximately 100 ft-bgs and is approximately 30-ft thick (described in the RI Report as the Coosawhatchie C unit). The Ebenezer Mbr. #1 water-bearing zone (approximately 50-ft thick) is the lowermost portion of the Surficial Aquifer, known as the "Rock Aquifer" and is a water supply source for domestic households within the county where public water is not served. The rock aquifer occurs at a depth of approximately 130 ft to 175 ft-bgs.

2.2.2 Deep Zone (Middle to Lower Miocene Formations)

At the base of the Ebenezer Fm. is the Berryville Clay Fm., a regional confining layer that protects the Upper Brunswick Aquifer. The Berryville Clay is about 80 ft thick and occurs at a depth of approximately 175 ft to 255 ft-bgs. The Upper and Lower Brunswick Aquifers, which lie beneath the Berryville Clay, occur within the lower part of the Miocene Formations. The Brunswick Aquifers comprise of multiple layers of confining beds and permeable water-bearing zones, and the confining layers generally consist of silty, montmorillonite clay and dense phosphatic limestone, dolomite, and marlstone. The Brunswick aquifer system spans a depth interval of approximately 255 to 500 ft-bgs.

The deepest formation of regional interest is the Floridan Aquifer system. The Upper Floridan Aquifer is the most prolific aquifer system in the Brunswick area and occurs in the extremely porous Ocala limestone. The limestone is found at depth of between 500 and 1,500 ft-bgs. The Floridan Aquifer is generally under artesian head and provides well yields in the range of 5,000 to 10,000 gallons per minute.

3 COPC EVALUATION

3.1 Exposure Units

3.1.1 Groundwater

For the purpose of the OU2 HHBRA, the Site-wide groundwater will be evaluated as two Exposure Units ("EU"). The EU are vertically defined as shallow groundwater in the Satilla Fm. and deep groundwater in the Ebenezer Fm. Laterally, each exposure unit will encompass the entirety of the available Site-wide monitoring well network including wells installed in the marsh west of the uplands. In this manner, all wells will factor into the screening and no COPC will be eliminated. The well network for each groundwater EU is provided on Figure 2 (Satilla Fm.) and Figure 3 (Ebenezer Mbr. #4/#3).

3.1.2 CBA Subsurface

For the purpose of the OU2 HHBRA, the subsurface soil in the CBA will be evaluated as one EU than encompasses the footprint of the CBA soil cover. The CBA is currently partitioned as a fenced unit within the upland area and is approximately 6 acres.

3.2 Data Overview and Use

3.2.1 Groundwater

Groundwater at the Site has been extensively characterized and monitored for 25 years. Various activities have occurred to prevent further release of contaminants to groundwater, to remove sources, and to treat areas impacted by caustic release where an elevated groundwater pH condition prevailed. The most recent fully comprehensive Site-wide groundwater monitoring event occurred in 2017. Subsequent focused monitoring events have occurred in 2018, 2019, and most recently August 2020.

The COPC screening is developed from a database query that extracts the most recent monitoring record for a given analyte at a given well over the 2017-2020 period. Given the contrast in the groundwater condition between the Satilla Fm. as compared to the Ebenezer Fm. the data set is segregated accordingly for the COPC screening.

3.2.2 CBA Subsurface

Investigation of the CBA dates back to 1981 following a geotechnical investigation of building settlement. Between 1994 and 1995, two investigations under the direction of the EPA targeted shallow soil across the footprint of the CBA including soil beneath the cell building foundations.

The initial investigation collected shallow soil with a hand auger, either in the soil adjacent to each cell building or beneath the building after coring through the concrete foundation slab. In 1995, the soil study was expanded to include mechanical excavation (*i.e.*, test pits) in areas of interest to allow for a more thorough assessment of the sub-foundation soil condition. The test pit program included a visual assessment of the soil for metallic mercury and analytical testing for mercury.

Additional characterization of the CBA was performed under the direction of the EPA in 1996-1997 under the Cell Building Area Subsurface Investigation ("CBASI") program. The CBASI was designed to characterize the nature and extent of metallic mercury in subsurface soils beneath the cell buildings and profile the underlying geologic subsurface. The most recent CBA characterization occurred in 2018 and comprised of continuous soil coring to the base of the Satilla across the CBA. Each core was examined for elemental mercury and indicators of petroleum and tested accordingly.

The COPC screening is developed from a database query that extracts all soil records for a given analyte located within the bounds of the CBA EU, defined as the area of the existing CBA soil cover. Data sets for each exposure scenario were selected on the basis of sample depth, where 'D1' (depth of top of sample interval) is the shallow extent of the soil sample and 'D2' (depth of base of sample interval) is the deep extent of the soil sample. An adjustment to pre-1997 soil sample depth was completed before data set extraction. The sample depth adjustment was performed to account for the addition of the CBA soil cover which was placed across the former cell buildings footprint during the uplands removal action. Post 1997 soil sample records were not adjusted as the sample depth was recorded in reference to the existing soil cover surface.

The thickness and configuration of the CBA soil cover was determined by a comparison of land surveys completed in 1994 and 1997. Figure 4 illustrates the sample depth correction factor applied to pre-1997 soil samples. An outcome of the soil sample depth adjustment is fewer soil samples occur within the top 1 ft of soil (primarily occurring at the perimeter of the soil cover where the soil cover tapers to the base grade). No soil sample intervals occur completely within the top 1 ft of soil due to the construction of the CBA soil cover. Therefore, the depth selection process for the industrial worker, residential, and trespasser scenario was modified (conservatively). The modification allows for any soil sample that spans partially the top 2 ft of the CBA soil to be conservatively included in the shallow scenario soil assessments. The depth selection process for the excavation worker is consistent with the approved OU3 HHRA.

Scenario	Applicable Depth	D1	D2
Industrial Worker/ Residential/Trespasser	*Upper 2 ft*	*< 2 ft*	--
Excavation Worker	*Upper 5 ft*	*< 5 ft*	*≤6 ft*

3.3 COPC Screening Process

The COPC screening process follows EPA Region 4 guidance (EPA, 2018) and the HHBRA conducted for OU3 (EPS, 2012) using the EPA Regional Screening Levels ("RSLs") for

residential, where RSLs were set at the lower of a 1 x 10^{-6} cancer risk for carcinogenic compounds and a target hazard quotient ("HQ") of 0.1 for non-carcinogens (EPA, 2020). The determination of whether a constituent was a COPC was based upon the following criteria:

1. Elimination of constituents for which the maximum detected concentration in a particular EU did not exceed the RSL;
2. Elimination of essential human nutrients (EPS, 2012): calcium, chloride, iodine, magnesium, phosphorus, potassium and sodium; and
3. Elimination of constituents that were detected in fewer than 5% of the samples, with the added provision that no more than 5% of the results for those constituents could have detection limits above the RSLs.

In instances where a constituent detected does not have an RSL value, a surrogate assignment of an RSL value is made from a constituent of similar physical/chemical property; note that a surrogate assignment list was provided by EPA Region 4 for the OU3 HHBRA which was applied herein (Appendix A). The COPC screening process is presented for groundwater in Table 1 (Satilla Fm.) and Table 2 (Ebenezer Fm.), and for the soil in Table 3 (surface soil) and Table 4 (subsurface soil).

3.4 Uncertainty Evaluation for COPCs

One element of uncertainty in the COPC screening process centers around instances where detection limits for a given analyte exceed the RSL value. In such instances, the detection limit value is conservatively treated as an actual detection and the screening rules applies as noted above, in which case a designation of Potential COPC ("PCOPC") is given to constituents that were not detected, but had more than 5% of detection limits greater than the screening level.

4 EXPOSURE ASSESSMENT

4.1 Overview

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of human exposure to COPCs. The exposure assessment describes current and future land use assumptions, characterizes exposure factors for potential receptors, discusses the mechanisms by which these receptors might potentially come in contact with COPCs in environmental media, and estimates the degree of contact between potential human receptors and these constituents. This information is integrated with estimates of exposure point concentration ("EPC") and intake assumptions to estimate quantitatively the exposure or dose.

4.2 Generalized OU2 Condition

4.2.1 Groundwater

Contaminated groundwater is centralized in the shallow Satilla Fm. with leakage of contaminants to the upper Ebenezer Fm. with regional confining layers beneath, isolating the Site condition from regional water supply aquifers (Brunswick Aquifer, Floridan Aquifer). The lesser condition in the upper Ebenezer Fm. indicates a high degree of concentration attenuation across the semi-confining cemented sandstone layer with marlstone beneath protecting from Rock Aquifer. The groundwater condition is well understood following 25 years of monitoring history and overall characterizes the groundwater condition as stable to declining (depending on the COPC) with no potential for the regional water supply aquifers to be impacted.

4.2.2 CBA Subsurface

The CBA has been occupied by industrial operations since the Site was first developed by Arco in 1919. First, the current CBA was developed as part of the Arco refinery operation that encompassed much of the Site upland. In the 1950s, the CBA was redeveloped by AlliedSignal with the construction of two mercury cell process buildings, i.e., the chlor-alkali facility, from which the area gets its current designation. Documented in the most recent subsurface work, elemental mercury remains present in the subsurface as discrete beads and its occurrence is focused in the southwest extent of each former cell building footprint. Mercury is detected in soil core samples from near-surface to the base of the Satilla. Polyaromatic hydrocarbons ("PAHs") were also ubiquitous throughout the CBA study area and generally occurred at the highest concentration from 8 to 12 ft-bgs, a lower depth limit of a probable petroleum smear zone caused by historical water table fluctuation. The former concrete foundations of the cell building remain in place and a clean backfill soil cover was placed over the entirety of the CBA in 1997 with a security fence. The CBA has remained in this state to the present.

4.3 Exposure Setting - Identification of Potential Receptors

4.3.1 Groundwater

A water well survey was completed in 1995 by the EPA that included the upland area surrounding the Site and Blythe Island across the Turtle River from the Site (EPA, 1995). No water supply wells were located in the immediate area of the Site with the nearest water wells located approximately 0.5 mile to the north of the Site side-gradient to the local area groundwater flow direction, and installed in the Rock Aquifer (underlying the Surficial Aquifer). The EPA sampled the wells to the north and they were found to be clean. Figure 5 shows industrial and city/county water supply wells in the area, all of which draw from much deeper aquifers separated by multiple regional confining layers from the Surficial Aquifer of the Site.

There are currently no drinking water wells in the Surficial Aquifer at the Site or near the Site. Given the groundwater condition is limited to this zone, there are no current receptors. The Site is currently zoned Basic Industrial and the anticipated future land use is commercial/industrial. The EPA has indicated that they do not anticipate future residential use of the upland soil at the Site and institutional controls will be put into place prohibiting residential use of the Site (EPA, 2019). Accordingly, exposure to the Surficial Aquifer condition is limited to construction worker activity. Nevertheless, the HHBRA will be based on unrestricted groundwater use (i.e., residential potable use) per EPA Guidance (EPA, 2018) that requires that potentially potable groundwater be evaluated for residential purposes. Accordingly, the future receptor is a hypothetical residential receptor using groundwater to supply all residential water needs. This serves as a conservative baseline evaluation of theoretical residential risk.

4.3.2 CBA Subsurface

Noted above, the Site is currently zoned Basic Industrial and the anticipated future land use is commercial/industrial. The EPA has indicated that they do not anticipate future residential use of the upland soil at the Site and institutional controls will likely be put into place prohibiting residential use of the Site (EPA, 2019). Furthermore, subsurface disturbance of the CBA will be prohibited and limited to minor reworking of the soil cover or addition of hardscape surface (e.g., parking or surface storage). The existing clean soil cover depth, which ranges from 2 ft to 3 ft except at the soil cover perimeter, removes from the risk assessment pathways that are limited to interaction with the top 1 ft of soil (e.g., residential or site worker). Accordingly, exposure to the CBA soil condition is limited to construction worker activity. Nevertheless, the HHBRA will be assess restricted and unrestricted use (i.e., residential exposure) per EPA Guidance (EPA, 2018) to the limits of available shallow soil data at the soil cover perimeter.

4.4 Exposure Units

4.4.1 Groundwater

As mentioned in Section 1, the two EUs will be evaluated for groundwater and are represented by the Satilla Fm. and Ebenezer Fm.

4.4.2 CBA Subsurface

As mentioned in Section 1, the CBA will be evaluated as a single EU (approximately 6 acres).

4.5 Potential Exposure Pathways (Conceptual Site Model)

Exposure is defined for risk purposes as contact with constituents in environmental media at the outer boundaries of the body, such as the gastrointestinal tract (for ingestion route), skin (for the dermal route), and lung (for inhalation route). Figure 6 depicts the Conceptual Site Model ("CSM") for the Site groundwater and includes ingestion of groundwater, dermal contact with groundwater and inhalation from groundwater use. Figure 7 depicts the CSM for the CBA and includes ingestion, dermal contact, and inhalation (fugitive dust and volatilization).

4.6 Exposure Parameters

Quantification of theoretical exposure of receptors to COPCs is a function of COPC concentrations and various exposure parameters that define both the conditions of exposure (*e.g.*, frequency of exposure and duration of exposure) and descriptors of potentially exposed receptors (*e.g.*, body weight, skin surface area). Exposure parameters refer to all of the variables used to calculate a daily human dose or intake level. The table below shows the exposure parameters that will be used in the HHBRA. Separate values are provided for child and adult residents.

In accordance with EPA guidance (1989), the exposure factors used in the HHBRA are intended to estimate both reasonable maximum exposure ("RME") and central tendency exposure ("CTE") to provide context to the range of possible hypothetical exposures at the site. RME is defined as *the maximum exposure that is reasonably expected to occur at a site* and EPA has indicated that individual factors included in estimating exposure for an RME receptor should result in a final exposure estimate that approximates and upper percentile from a range of possible exposure estimates (EPA, 1991). The selected factors are based primarily on those included in the OU3 risk assessment with some updates (as noted) based on current default exposure factors used by USEPA.

Exposure Factors

Symbol	Definition	Receptor	RME Value	CTE Value	Units
IRw	Drinking Water Ingestion Rate	Child	0.78 [1]	0.45 [3a]	L/d
		Adult	2.5 [1]	1.2 [3a]	L/d
IRs	Soil Ingestion Rate	Child	200 [1,2]	100 [1,2]	mg/d
		Adult	100 [1,2]	50 [1,2]	mg/d
		Const Wkr	330 [2]	100 [2]	mg/d
SAw	Skin Surface Area (Water)	Child	6,365 [1]	6,365 [1]	cm^2
		Adult	19,652 [1]	19,652 [1]	cm^2
SAs	Skin Surface Area (Soil)	Child	2,373 [1]	1,800 [2]	cm^2
		Adult	6,032 [1]	4,800 [2]	cm^2
		Const Wkr	3,527 [1]	1,900 [2]	cm^2
AF	Soil Adherence Factor	Child	0.2 [1,2]	0.2 [1,2]	mg/cm^2
		Adult	0.07 [1,2]	0.07 [1,2]	mg/cm^2
		Const Wkr	0.3 [2]	0.1 [2]	mg/cm^2
BW	Body Weight	Child	15 [1,2]	15 [1,2]	kg
		Adult	80 [1]	80 [1]	kg
		Const Wkr	80 [1]	80 [1]	kg
EF	Exposure Frequency	Resident	350 [1,2]	256 [2]	d/yr
		Const Wkr	260 [2]	260 [2]	d/yr
ED	Exposure Duration	Resident	26 [1]	12 [3b]	yr
		Child	6 [1]	3 [3b]	yr
		Adult	20 [1]	9 [3b]	yr
		Const Wkr	0.5 [2]	0.23 [2]	yr
ETw	Exposure Time (Water)	Resident	24 [1]	24 [1]	hr/d
ETw	Exposure Time per Event (Water)	Child	0.54 [1]	0.33 [4]	hr/ev
		Adult	0.71 [1]	0.25 [4]	hr/ev
EV	Events per Day	Resident	1 [2]	1 [2]	ev/d
ETas	Exposure Time (Air/Soil)	Resident	24 [1]	24 [1]	hr/d
		Const Wkr	8 [1]	8 [1]	hr/d
AT	Averaging Time – Noncarcinogens		ED x 365	ED x 365	days
	Averaging Time – Carcinogens		25,550	25,550	days

Sources:
[1]EPA, 2014a
[2]EPS, 2012
[3]EPA, 2011:
a) Weighted mean of consumer-only ingestion of drinking water (Table 3-1).
b) Average residential occupancy period (Table 16-5). Assume 3 as a child and 9 as an adult.
[4]EPA, 2004

4.7 Exposure Point Concentrations

4.7.1 Overview

The EPC is the representative concentration of a given COPC with which the receptor is potentially in contact. A representative COPC-specific EPC value is incorporated into the exposure assessment equations from which potential human exposures are calculated. The EPC is intended to be a conservative estimate of the average concentration at a given point in time (EPA, 2014b).

EPA guidance (EPA, 1992; 2002) indicates that the COPC-specific RME EPC shall be the lesser of either (i) the 95% upper confidence limit ("UCL") of the arithmetic mean or (ii) the maximum detected concentration. The purpose for using the 95% UCL instead of the average concentration is to account for *the uncertainty associated with estimating the true average concentration at a site…[and] the 95% UCL provides reasonable confidence that the true site average will not be underestimated* (EPA, 1992). These values will also be used to evaluate the CTE exposure scenarios.

4.7.2 Soil EPC

The soil EPC will be determined as outlined above, the lesser of either (i) the 95% upper UCL of the arithmetic mean or (ii) the maximum detected concentration. An EPC will be determined for each applicable human receptor. The following principles will be used to determine the datasets used for soil EPC calculations:

- Soil sample depth applicable to each land use scenario will adhere to the depth selection process as detailed in Section 3.2.2:

Scenario	Applicable Depth	D1	D2
Industrial Worker/ Residential/Trespasser	*Upper 2 ft*	*< 2*	--
Excavation Worker	*Upper 5 ft*	*< 5 ft*	*≤6 ft*

- The historical sampling depth (pre-1997) will be adjusted to account for the clean soil cover;
- Duplicate results (e.g., blind sample duplicates) will not be included; and
- All existing sampling results will be used to determine the EPC (note that historical results tend to exhibit elevated detection limits and will be addressed as a point of uncertainty).

EPA's ProUCL software package will be used to statistically evaluate the "goodness of fit" of the data distribution for each of the aquifer-EU-specific data sets considering different distribution approaches (including non-detect data records) to determine the 95% UCL.

4.7.3 Groundwater EPC

EPA Region 4 guidance (EPA, 2018) recommends that groundwater EPCs be calculated in accordance with *Determining Groundwater Exposure Point Concentrations, Supplemental Guidance*. Per this Guidance, EPCs should be calculated using recent, and *from the core of the plume* data. The preference is to use data from two sampling events collected preferably within the previous year. However, although groundwater data has been collected at the Site for 25 years, the RPs did not conduct systematic monitoring. The most recent Site-wide groundwater sampling event was conducted in 2017 after remedial action was taken at the Site. Of the 125 wells located in the EU that were sampled in 2017, 90 were sampled at least once more since that event. Many of these wells are clustered or nested wells that are in the same location. The following principles will be used to determine the datasets used for groundwater EPC calculations:

- Sampling results collected in the 2017-2020 time period will be used;
- Where there are nested wells at the same location within the same aquifer, the highest concentrations will be used;
- Separate EPCs for each aquifer (i.e. Satilla and Ebenezer) will be calculated; and
- Duplicate results (e.g., blind sample duplicates) will not be included.

EPA's ProUCL software package will be used to statistically evaluate the "goodness of fit" of the data distribution for each of the aquifer-EU-specific data sets considering different distribution approaches (including non-detect data records) to determine the 95% UCL.

4.8 Quantification of Exposure

To quantify the theoretical exposure of receptors to all COPCs, concentrations of each COPC are combined with the exposure parameters to estimate a daily dose that the receptor would have. For noncarcinogenic constituents, the daily dose is called the Average Daily Dose ("ADD"), which is an estimate of potentially daily intake. For carcinogenic constituents, it is called the Lifetime Average Daily Dose ("LADD"), which is the estimated daily intake over the course of a lifetime. The equations used to calculate the ADD and LADDs will be based on equations[1] used for EPA's RSLs.

[1] https://www.epa.gov/risk/regional-screening-levels-rsls-equations

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Tables

Table 1.
COPC Selection: Satilla Groundwater Exposure Unit

Parameter	Detection Frequency	% Detects	Minimum Detection	Maximum Detection	# ND	Minimum DL or ND	Maximum DL for ND	MCL	RSL-Tap	Screening Level	# Detects Above Screening Level	#ND-DL Above Screening Level	% ND-DL above Screening Level	Constituent Status
Inorganics														
Aluminum	165 / 180	91.7%	3.00	172,000	15	4.00	390	--	2000	2000	81	0	0%	COPC
Antimony	37 / 180	20.6%	0.020	4.09	143	0.020	16.0	6	0.78	0.78	10	27	15.0%	COPC
Arsenic	141 / 180	78.3%	0.090	153	39	0.080	16.0	10	0.052	0.052	141	39	21.7%	COPC
Barium	180 / 180	100.0%	1.31	2,800	0	--	--	2000	380	380	24	0	0%	COPC
Beryllium	154 / 180	85.6%	0.0040	57	26	0.0040	2.40	4	2.5	2.5	77	0	0%	COPC
Cadmium	71 / 325	21.8%	0.0080	2.70	254	0.0060	3.00	5	0.92	0.92	13	32	9.8%	COPC
Calcium	180 / 180	100.0%	71	686,000	0	--	--	--	--	NA	0	0	0%	--
Chromium	174 / 180	96.7%	0.060	1,200	6	0.20	1.60	100	--	100	66	0	0%	COPC
Cobalt	132 / 180	73.3%	0.0070	16.0	48	0.012	3.10	--	0.6	0.6	75	19	10.6%	COPC
Copper	121 / 180	67.2%	0.040	210	59	0.030	12.0	1300	80	80	2	0	0%	COPC
Iron	177 / 180	98.3%	10.0	52,100	3	3.00	56	--	1400	1400	105	0	0%	COPC
Lead	144 / 180	80.0%	0.0050	209	36	0.020	7.10	15	15	15	31	0	0%	COPC
Magnesium	180 / 180	100.0%	29	613,000	0	--	--	--	--	NA	0	0	0%	--
Manganese	173 / 180	96.1%	1.10	1,590	7	0.30	63	--	43	43	103	1	0.6%	COPC
Mercury	171 / 180	95.0%	0.0002	353	9	0.0003	0.25	2	0.063	0.063	125	2	1.1%	COPC
Nickel	135 / 180	75.0%	0.040	170	45	0.040	12.0	--	39	39	18	0	0%	COPC
Potassium	176 / 180	97.8%	140	180,000	4	744	1,100	--	--	NA	0	0	0%	--
Selenium	129 / 180	71.7%	0.080	180	51	0.070	22	50	10	10	61	21	11.7%	COPC
Silver	9 / 180	5.0%	0.0050	0.46	171	0.0050	5.00	--	9.4	9.4	0	0	0%	--
Sodium	180 / 180	100.0%	4,470	17,000,000	0	--	--	--	--	NA	0	0	0%	--
Thallium	26 / 180	14.4%	0.0070	11.1	154	0.0060	8.10	2	0.02	0.02	19	135	75.0%	COPC
Vanadium	170 / 180	94.4%	0.60	3,200	10	0.50	8.58	--	8.6	8.6	137	0	0%	COPC
Zinc	117 / 180	65.0%	0.30	1,390	63	0.20	120	--	600	600	1	0	0%	COPC
PCB														
Aroclor-1016	0 / 10	0%	ND	ND	10	0.024	0.26	--	0.14	0.14	0	4	40.0%	P
Aroclor-1221	0 / 10	0%	ND	ND	10	0.040	0.42	--	0.0047	0.0047	0	10	100.0%	P
Aroclor-1232	0 / 10	0%	ND	ND	10	0.024	0.26	--	0.0047	0.0047	0	10	100.0%	P
Aroclor-1242	0 / 10	0%	ND	ND	10	0.024	0.26	--	0.0078	0.0078	0	10	100.0%	P
Aroclor-1248	0 / 10	0%	ND	ND	10	0.024	0.26	--	0.0078	0.0078	0	10	100.0%	P
Aroclor-1254	0 / 10	0%	ND	ND	10	0.024	0.53	--	0.0078	0.0078	0	10	100.0%	P
Aroclor-1260	2 / 10	20.0%	0.14	0.78	8	0.024	0.26	--	0.0078	0.0078	2	8	80.0%	COPC
Aroclor-1262	0 / 10	0%	ND	ND	10	0.024	0.26	--	--	NA	0	0	0%	--
Aroclor-1268	1 / 10	10.0%	0.073	0.073	9	0.024	0.26	--	--	NA	0	0	0%	--
SVOC														
1,2,3-Trichlorobenzene	0 / 170	0%	ND	ND	170	0.050	100	--	0.7	0.7	0	60	35.3%	P
1,2,4-Trichlorobenzene	17 / 170	10.0%	0.10	58	153	0.060	120	70	0.4	0.4	13	104	61.2%	COPC
1,2-Dichlorobenzene	49 / 170	28.8%	0.21	390	121	0.060	120	600	30	30	8	4	2.4%	COPC
1,3-Dichlorobenzene	34 / 170	20.0%	0.070	220	136	0.060	120	--	30	30	4	4	2.4%	COPC
1,4-Dichlorobenzene	41 / 170	24.1%	0.20	230	129	0.070	140	75	0.48	0.48	39	80	47.1%	COPC
1-Methyl Naphthalene	136 / 170	80.0%	0.0043	180	34	0.0013	0.025	--	1.1	1.1	70	0	0%	COPC
2-Methylnaphthalene	120 / 170	70.6%	0.0026	230	50	0.0023	0.10	--	3.6	3.6	27	0	0%	COPC
Acenaphthene	115 / 170	67.6%	0.012	8.00	55	0.0012	5.10	--	53	53	0	0	0%	--
Acenaphthylene	54 / 170	31.8%	0.0042	0.40	116	0.0011	0.44	--	12	12	0	0	0%	--
Anthracene	110 / 170	64.7%	0.0037	1.00	60	0.0008	1.80	--	180	180	0	0	0%	--
Benzo(a)anthracene	66 / 170	38.8%	0.0024	2.00	104	0.0010	0.050	--	0.03	0.03	36	18	10.6%	COPC
Benzo(a)pyrene	53 / 170	31.2%	0.0088	1.00	117	0.0011	0.050	0.2	0.025	0.025	35	20	11.8%	COPC
Benzo(b)fluoranthene	70 / 170	41.2%	0.0072	0.90	100	0.0008	0.050	--	0.25	0.25	7	0	0%	COPC
Benzo(g,h,i)perylene	51 / 170	30.0%	0.0035	0.70	119	0.0009	0.050	--	12	12	0	0	0%	--
Benzo(k)fluoranthene	24 / 170	14.1%	0.0045	0.40	146	0.0009	0.11	--	2.5	2.5	0	0	0%	--
Chrysene	44 / 170	25.9%	0.0035	2.00	126	0.0008	0.050	--	25	25	0	0	0%	--

Units: mg/kg (milligrams per kilogram)

ND: non-detect

RSL: Regional SCreening Level, Residential

COPC: Constituent of Potentail Concern

P: Potentail COPC

Table 1.
COPC Selection: Satilla Groundwater Exposure Unit

Parameter	Detection Frequency	% Detects	Minimum Detection	Maximum Detection	# ND	Minimum DL or ND	Maximum DL for ND	MCL	RSL-Tap	Screening Level	# Detects Above Screening Level	#ND-DL Above Screening Level	% ND-DL above Screening Level	Constituent Status
Dibenzo(a,h)anthracene	9 / 170	5.3%	0.0030	0.40	161	0.0013	0.22	--	0.025	0.025	5	34	20.0%	COPC
Dibenzofuran	84 / 170	49.4%	0.0100	3.00	86	0.0010	0.89	--	0.79	0.79	6	1	0.6%	COPC
Fluoranthene	57 / 170	33.5%	0.0046	1.00	113	0.0008	0.057	--	80	80	0	0	0%	--
Fluorene	107 / 170	62.9%	0.0100	4.00	63	0.0011	0.050	--	29	29	0	0	0%	--
Hexachlorobutadiene	0 / 170	0%	ND	ND	170	0.070	140	--	0.14	0.14	0	110	64.7%	P
Indeno(1,2,3-cd)pyrene	45 / 170	26.5%	0.0042	0.50	125	0.0009	0.050	--	0.25	0.25	2	0	0%	COPC
Naphthalene	144 / 170	84.7%	0.0041	420	26	0.0038	0.21	--	0.17	0.17	119	2	1.2%	COPC
Phenanthrene	78 / 170	45.9%	0.0052	6.00	92	0.0050	0.20	--	12	12	0	0	0%	--
Pyrene	83 / 170	48.8%	0.0081	6.00	87	0.0010	0.050	--	12	12	0	0	0%	--
VOC														
1,1,1,2-Tetrachloroethane	0 / 170	0%	ND	ND	170	0.070	140	--	0.57	0.57	0	98	57.6%	P
1,1,1-Trichloroethane	0 / 170	0%	ND	ND	170	0.060	120	200	800	200	0	0	0%	--
1,1,2,2-Tetrachloroethane	3 / 170	1.8%	0.11	0.75	167	0.070	140	--	0.076	0.076	3	159	93.5%	COPC
1,1,2-Trichloroethane	1 / 170	0.6%	22	22	169	0.060	120	5	0.041	0.041	1	169	99.4%	COPC
1,1-Dichloroethane	37 / 170	21.8%	0.090	6.10	133	0.070	140	--	2.8	2.8	4	38	22.4%	COPC
1,1-Dichloroethene	6 / 170	3.5%	0.090	4.80	164	0.060	120	7	28	7	0	16	9.4%	P
1,1-Dichloropropene	3 / 170	1.8%	0.26	1.20	167	0.050	100	--	0.47	0.47	1	67	39.4%	COPC
1,2,3-Trichloropropane	2 / 170	1.2%	0.46	1.20	168	0.10	200	--	0.00075	0.00075	2	168	98.8%	COPC
1,2,4-Trimethylbenzene	72 / 170	42.4%	0.070	1,100	98	0.060	120	--	5.6	5.6	30	19	11.2%	COPC
1,2-Dibromo-3-chloropropane	1 / 170	0.6%	0.27	0.27	169	0.10	200	0.2	0.00033	0.00033	1	169	99.4%	COPC
1,2-Dibromoethane	2 / 170	1.2%	0.11	0.15	168	0.060	120	0.05	0.0075	0.0075	2	168	98.8%	COPC
1,2-Dichloroethane	5 / 170	2.9%	0.064	5.10	165	0.050	100	5	0.17	0.17	1	108	63.5%	COPC
1,2-Dichloropropane	11 / 170	6.5%	0.13	3.60	159	0.060	120	5	0.82	0.82	2	60	35.3%	COPC
1,3,5-Trimethylbenzene	48 / 170	28.2%	0.10	270	122	0.060	120	--	6	6	15	14	8.2%	COPC
1,3-Dichloropropane	0 / 170	0%	ND	ND	170	0.070	140	--	37	37	0	4	2.4%	--
2,2-Dichloropropane	2 / 170	1.2%	0.070	0.080	168	0.050	100	--	37	37	0	4	2.4%	--
2-Butanone (MEK)	3 / 170	1.8%	4.80	24	167	0.60	1,200	--	560	560	0	4	2.4%	--
2-Chlorotoluene	6 / 170	3.5%	0.089	55	164	0.070	140	--	24	24	1	7	4.1%	COPC
2-Hexanone	4 / 170	2.4%	0.76	15.0	166	0.60	1,200	--	3.8	3.8	2	107	62.9%	COPC
4-Chlorotoluene	2 / 170	1.2%	0.076	0.55	168	0.070	140	--	25	25	0	7	4.1%	--
4-Methyl-2-pentanone	0 / 170	0%	ND	ND	170	0.70	1,400	--	630	630	0	4	2.4%	--
Acetone	60 / 170	35.3%	1.80	2,100	110	0.90	1,800	--	1400	1400	1	3	1.8%	COPC
Benzene	85 / 170	50.0%	0.080	54	85	0.050	100	5	0.46	0.46	67	56	32.9%	COPC
Bromobenzene	0 / 170	0%	ND	ND	170	0.060	120	--	6.2	6.2	0	16	9.4%	P
Bromochloromethane	0 / 170	0%	ND	ND	170	0.050	100	--	8.3	8.3	0	16	9.4%	P
Bromodichloromethane	2 / 170	1.2%	0.068	0.56	168	0.050	100	80	0.13	0.13	1	109	64.1%	COPC
Bromoform	0 / 170	0%	ND	ND	170	0.16	600	80	3.3	3.3	0	55	32.4%	P
Bromomethane	0 / 170	0%	ND	ND	170	0.070	140	--	0.75	0.75	0	69	40.6%	P
Carbon disulfide	87 / 170	51.2%	0.070	4.70	83	0.060	120	--	81	81	0	4	2.4%	--
Carbon tetrachloride	0 / 170	0%	ND	ND	170	0.070	140	5	0.46	0.46	0	107	62.9%	P
Chlorobenzene	54 / 170	31.8%	0.10	1,400	116	0.060	120	100	7.8	7.8	30	15	8.8%	COPC
Chloroethane	8 / 170	4.7%	0.10	5.10	162	0.070	140	--	2100	2100	0	0	0%	--
Chloroform	6 / 170	3.5%	0.24	1.10	164	0.072	180	80	0.22	0.22	6	104	61.2%	COPC
Chloromethane	16 / 170	9.4%	0.080	5.30	154	0.060	120	--	19	19	0	7	4.1%	--
cis-1,2-Dichloroethene	57 / 170	33.5%	0.060	15.0	113	0.050	100	70	3.6	3.6	5	22	12.9%	COPC
cis-1,3-Dichloropropene	0 / 170	0%	ND	ND	170	0.050	100	--	0.47	0.47	0	76	44.7%	P
Dibromochloromethane	0 / 170	0%	ND	ND	170	0.070	140	80	0.87	0.87	0	60	35.3%	P
Dibromomethane	0 / 170	0%	ND	ND	170	0.060	120	--	0.83	0.83	0	60	35.3%	P
Dichlorodifluoromethane	0 / 170	0%	ND	ND	170	0.050	100	--	20	20	0	7	4.1%	--
Dichloromethane	47 / 170	27.6%	0.070	210	123	0.070	140	5	11	5	6	19	11.2%	COPC
Ethyl benzene	80 / 170	47.1%	0.050	680	90	0.050	120	700	1.5	1.5	57	31	18.2%	COPC

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COPC: Constituent of Potentail Concern

P: Potentail COPC

Table 1.
COPC Selection: Satilla Groundwater Exposure Unit

Parameter	Detection Frequency	% Detects	Minimum Detection	Maximum Detection	# ND	Minimum DL or ND	Maximum DL for ND	MCL	RSL-Tap	Screening Level	# Detects Above Screening Level	#ND-DL Above Screening Level	% ND-DL above Screening Level	Constituent Status
Isopropylbenzene	83 / 170	48.8%	0.060	150	87	0.050	100	--	45	45	2	3	1.8%	COPC
m&p-Xylene	57 / 170	33.5%	0.11	1,700	113	0.10	200	10000	19	19	6	15	8.8%	COPC
n-Butylbenzene	39 / 170	22.9%	0.070	21	131	0.050	100	--	100	100	0	0	0%	--
n-Propylbenzene	74 / 170	43.5%	0.060	58	96	0.054	120	--	66	66	0	4	2.4%	--
o-Xylene	57 / 170	33.5%	0.050	170	113	0.050	100	--	19	19	6	7	4.1%	COPC
p-Isopropyltoluene	45 / 170	26.5%	0.070	19.0	125	0.050	100	1000	110	110	0	0	0%	--
sec-Butylbenzene	62 / 170	36.5%	0.062	24	108	0.060	120	--	200	200	0	0	0%	--
Styrene	0 / 170	0%	ND	ND	170	0.050	100	100	120	100	0	0	0%	--
tert-Butylbenzene	62 / 170	36.5%	0.090	17.0	108	0.059	140	--	69	69	0	4	2.4%	--
Tetrachloroethene	2 / 170	1.2%	0.65	1.10	168	0.060	120	5	4.1	4.1	0	23	13.5%	P
Toluene	78 / 170	45.9%	0.070	430	92	0.054	140	1000	110	110	1	4	2.4%	COPC
trans-1,2-Dichloroethene	12 / 170	7.1%	0.090	6.80	158	0.060	120	100	36	36	0	4	2.4%	--
trans-1,3-Dichloropropene	0 / 170	0%	ND	ND	170	0.060	120	--	0.47	0.47	0	67	39.4%	P
Trichloroethene	10 / 170	5.9%	0.11	3.70	160	0.060	120	5	0.28	0.28	9	106	62.4%	COPC
Trichlorofluoromethane	0 / 170	0%	ND	ND	170	0.050	100	--	520	520	0	0	0%	--
Vinyl chloride	4 / 170	2.4%	0.24	3.10	166	0.075	200	2	0.019	0.019	4	166	97.6%	COPC

Units: mg/kg (milligrams per kilogram)
ND: non-detect
RSL: Regional SCreening Level, Residential

COPC: Constituent of Potentail Concern
P: Potentail COPC

Table 2.
COPC Selection: Ebenezer Groundwater Exposure Unit

Parameter	Detection Frequency	% Detects	Minimum Detection	Maximum Detection	# ND	Minimum DL or ND	Maximum DL for ND	MCL	RSL-Tap	Screening Level	# Detects Above Screening Level	#ND-DL Above Screening Level	% ND-DL above Screening Level	Status
Inorganics														
Aluminum	7 / 25	28.0%	32	4,560	18	4.00	390	--	2000	2000	1	0	0%	COPC
Antimony	1 / 25	4.0%	0.11	0.11	24	0.020	8.10	6	0.78	0.78	0	6	24.0%	P
Arsenic	26 / 38	68.4%	0.060	81	12	1.00	14.0	10	0.052	0.052	26	12	31.6%	COPC
Barium	20 / 25	80.0%	2.04	259	5	15.0	15.0	2000	380	380	0	0	0%	--
Beryllium	8 / 25	32.0%	0.030	0.48	17	0.0040	2.40	4	2.5	2.5	0	0	0%	--
Cadmium	2 / 44	4.5%	0.70	0.70	42	0.0060	3.00	5	0.92	0.92	0	5	11.4%	P
Calcium	24 / 25	96.0%	2,700	447,000	1	1,500	1,500	--	--	NA	0	0	0%	--
Chromium	28 / 38	73.7%	0.33	110	10	0.21	10.0	100	--	100	1	0	0%	COPC
Cobalt	16 / 25	64.0%	0.019	0.90	9	0.15	3.10	--	0.6	0.6	1	5	20.0%	COPC
Copper	17 / 25	68.0%	0.11	28	8	1.01	7.20	1300	80	80	0	0	0%	--
Iron	23 / 25	92.0%	58	14,600	2	460	460	--	1400	1400	9	0	0%	COPC
Lead	6 / 25	24.0%	0.037	3.37	19	0.20	1.40	15	15	15	0	0	0%	--
Magnesium	19 / 25	76.0%	691	55,300	6	210	278	--	--	NA	0	0	0%	--
Manganese	14 / 25	56.0%	4.20	1,120	11	5.05	13.0	--	43	43	10	0	0%	COPC
Mercury	31 / 38	81.6%	0.0021	25	7	0.0008	0.083	2	0.063	0.063	24	1	2.6%	COPC
Nickel	16 / 25	64.0%	0.060	46	9	2.00	12.0	--	39	39	3	0	0%	COPC
Potassium	25 / 25	100.0%	870	170,000	0	--	--	--	--	NA	0	0	0%	--
Selenium	7 / 25	28.0%	1.50	58	18	0.070	22	50	10	10	6	10	40.0%	COPC
Silver	0 / 25	0%	ND	ND	25	0.0050	85	--	9.4	9.4	0	1	4.0%	--
Sodium	25 / 25	100.0%	13,700	31,100,000	0	--	--	--	--	NA	0	0	0%	--
Thallium	2 / 25	8.0%	0.0080	0.013	23	0.13	2.60	2	0.02	0.02	0	23	92.0%	P
Vanadium	19 / 25	76.0%	12.0	520	6	0.50	8.60	--	8.6	8.6	19	2	8.0%	COPC
Zinc	8 / 25	32.0%	0.60	30	17	8.08	120	--	600	600	0	0	0%	--
SVOC														
1,2,3-Trichlorobenzene	0 / 25	0%	ND	ND	25	0.050	10.0	--	0.7	0.7	0	11	44.0%	P
1,2,4-Trichlorobenzene	0 / 25	0%	ND	ND	25	0.060	12.0	70	0.4	0.4	0	19	76.0%	P
1,2-Dichlorobenzene	0 / 25	0%	ND	ND	25	0.060	12.0	600	30	30	0	0	0%	--
1,3-Dichlorobenzene	0 / 25	0%	ND	ND	25	0.060	12.0	--	30	30	0	0	0%	--
1,4-Dichlorobenzene	0 / 25	0%	ND	ND	25	0.070	14.0	75	0.48	0.48	0	19	76.0%	P
1-Methyl Naphthalene	13 / 25	52.0%	0.0042	0.70	12	0.0035	0.050	--	1.1	1.1	0	0	0%	--
2-Methylnaphthalene	10 / 25	40.0%	0.0045	1.10	15	0.0023	0.10	--	3.6	3.6	0	0	0%	--
Acenaphthene	1 / 25	4.0%	0.020	0.020	24	0.0044	0.050	--	53	53	0	0	0%	--
Acenaphthylene	1 / 25	4.0%	0.080	0.080	24	0.0034	0.050	--	12	12	0	0	0%	--
Anthracene	3 / 25	12.0%	0.031	0.032	22	0.0036	0.050	--	180	180	0	0	0%	--
Benzo(a)anthracene	5 / 25	20.0%	0.0043	0.39	20	0.0026	0.050	--	0.03	0.03	2	9	36.0%	COPC
Benzo(a)pyrene	5 / 25	20.0%	0.015	0.48	20	0.0043	0.050	0.2	0.025	0.025	4	8	32.0%	COPC
Benzo(b)fluoranthene	5 / 25	20.0%	0.025	0.48	20	0.0041	0.050	--	0.25	0.25	1	0	0%	COPC
Benzo(g,h,i)perylene	5 / 25	20.0%	0.015	0.54	20	0.0029	0.050	--	12	12	0	0	0%	--
Benzo(k)fluoranthene	5 / 25	20.0%	0.011	0.49	20	0.0030	0.050	--	2.5	2.5	0	0	0%	--
Chrysene	4 / 25	16.0%	0.018	0.46	21	0.0034	0.050	--	25	25	0	0	0%	--
Dibenzo(a,h)anthracene	1 / 25	4.0%	0.59	0.59	24	0.0025	0.10	--	0.025	0.025	1	9	36.0%	COPC
Dibenzofuran	0 / 25	0%	ND	ND	25	0.0093	0.050	--	0.79	0.79	0	0	0%	--
Fluoranthene	4 / 25	16.0%	0.015	0.18	21	0.0100	0.050	--	80	80	0	0	0%	--
Fluorene	2 / 25	8.0%	0.0100	0.0100	23	0.0038	0.050	--	29	29	0	0	0%	--
Hexachlorobutadiene	0 / 25	0%	ND	ND	25	0.070	14.0	--	0.14	0.14	0	19	76.0%	P
Indeno(1,2,3-cd)pyrene	6 / 25	24.0%	0.012	0.64	19	0.0026	0.050	--	0.25	0.25	1	0	0%	COPC
Naphthalene	8 / 25	32.0%	0.030	0.51	17	0.0038	0.20	--	0.17	0.17	3	7	28.0%	COPC
Phenanthrene	4 / 25	16.0%	0.0089	0.062	21	0.0050	0.20	--	12	12	0	0	0%	--
Pyrene	6 / 25	24.0%	0.0100	0.16	19	0.0053	0.050	--	12	12	0	0	0%	--
VOC														

Units: mg/kg (milligrams per kilogram)

ND: non-detect

RSL: Regional SCreening Level, Residential

COPC: Constituent of Potentail Concern

P: Potentail COPC

Table 2.
COPC Selection: Ebenezer Groundwater Exposure Unit

Parameter	Detection Frequency	% Detects	Minimum Detection	Maximum Detection	# ND	Minimum DL or ND	Maximum DL for ND	MCL	RSL-Tap	Screening Level	# Detects Above Screening Level	#ND-DL Above Screening Level	% ND-DL above Screening Level	Status
1,1,1,2-Tetrachloroethane	0 / 25	0%	ND	ND	25	0.070	14.0	--	0.57	0.57	0	19	76.0%	P
1,1,1-Trichloroethane	0 / 25	0%	ND	ND	25	0.060	12.0	200	800	200	0	0	0%	--
1,1,2,2-Tetrachloroethane	0 / 25	0%	ND	ND	25	0.070	14.0	--	0.076	0.076	0	22	88.0%	P
1,1,2-Trichloroethane	0 / 25	0%	ND	ND	25	0.060	12.0	5	0.041	0.041	0	25	100.0%	P
1,1-Dichloroethane	0 / 25	0%	ND	ND	25	0.070	14.0	--	2.8	2.8	0	8	32.0%	P
1,1-Dichloroethene	0 / 25	0%	ND	ND	25	0.060	12.0	7	28	7	0	1	4.0%	--
1,1-Dichloropropene	0 / 25	0%	ND	ND	25	0.050	10.0	--	0.47	0.47	0	13	52.0%	P
1,2,3-Trichloropropane	0 / 25	0%	ND	ND	25	0.10	20	--	0.00075	0.00075	0	25	100.0%	P
1,2,4-Trimethylbenzene	0 / 25	0%	ND	ND	25	0.060	12.0	--	5.6	5.6	0	1	4.0%	--
1,2-Dibromo-3-chloropropane	0 / 25	0%	ND	ND	25	0.10	20	0.2	0.00033	0.00033	0	25	100.0%	P
1,2-Dibromoethane	0 / 25	0%	ND	ND	25	0.060	12.0	0.05	0.0075	0.0075	0	25	100.0%	P
1,2-Dichloroethane	0 / 25	0%	ND	ND	25	0.050	10.0	5	0.17	0.17	0	19	76.0%	P
1,2-Dichloropropane	0 / 25	0%	ND	ND	25	0.060	12.0	5	0.82	0.82	0	11	44.0%	P
1,3,5-Trimethylbenzene	0 / 25	0%	ND	ND	25	0.060	12.0	--	6	6	0	1	4.0%	--
1,3-Dichloropropane	0 / 25	0%	ND	ND	25	0.070	14.0	--	37	37	0	0	0%	--
2,2-Dichloropropane	0 / 25	0%	ND	ND	25	0.050	10.0	--	37	37	0	0	0%	--
2-Butanone (MEK)	2 / 25	8.0%	26	32	23	0.60	120	--	560	560	0	0	0%	--
2-Chlorotoluene	0 / 25	0%	ND	ND	25	0.070	14.0	--	24	24	0	0	0%	--
2-Hexanone	0 / 25	0%	ND	ND	25	0.60	120	--	3.8	3.8	0	19	76.0%	P
4-Chlorotoluene	0 / 25	0%	ND	ND	25	0.070	14.0	--	25	25	0	0	0%	--
4-Methyl-2-pentanone	0 / 25	0%	ND	ND	25	0.70	140	--	630	630	0	0	0%	--
Acetone	8 / 25	32.0%	3.50	230	17	0.90	180	--	1400	1400	0	0	0%	--
Benzene	5 / 25	20.0%	0.050	2.60	20	0.050	10.0	5	0.46	0.46	4	16	64.0%	COPC
Bromobenzene	0 / 25	0%	ND	ND	25	0.060	12.0	--	6.2	6.2	0	1	4.0%	--
Bromochloromethane	0 / 25	0%	ND	ND	25	0.050	10.0	--	8.3	8.3	0	1	4.0%	--
Bromodichloromethane	0 / 25	0%	ND	ND	25	0.050	10.0	80	0.13	0.13	0	19	76.0%	P
Bromoform	0 / 25	0%	ND	ND	25	0.16	60	80	3.3	3.3	0	11	44.0%	P
Bromomethane	0 / 25	0%	ND	ND	25	0.070	14.0	--	0.75	0.75	0	11	44.0%	P
Carbon disulfide	8 / 25	32.0%	0.090	2.70	17	0.060	12.0	--	81	81	0	0	0%	--
Carbon tetrachloride	0 / 25	0%	ND	ND	25	0.070	14.0	5	0.46	0.46	0	19	76.0%	P
Chlorobenzene	0 / 25	0%	ND	ND	25	0.060	12.0	100	7.8	7.8	0	1	4.0%	--
Chloroethane	0 / 25	0%	ND	ND	25	0.070	14.0	--	2100	2100	0	0	0%	--
Chloroform	0 / 25	0%	ND	ND	25	0.072	18.0	80	0.22	0.22	0	19	76.0%	P
Chloromethane	1 / 25	4.0%	0.11	0.11	24	0.060	12.0	--	19	19	0	0	0%	--
cis-1,2-Dichloroethene	1 / 25	4.0%	0.50	0.50	24	0.050	10.0	70	3.6	3.6	0	1	4.0%	--
cis-1,3-Dichloropropene	0 / 25	0%	ND	ND	25	0.050	10.0	--	0.47	0.47	0	13	52.0%	P
Dibromochloromethane	0 / 25	0%	ND	ND	25	0.070	14.0	80	0.87	0.87	0	11	44.0%	P
Dibromomethane	0 / 25	0%	ND	ND	25	0.060	12.0	--	0.83	0.83	0	11	44.0%	P
Dichlorodifluoromethane	0 / 25	0%	ND	ND	25	0.050	10.0	--	20	20	0	0	0%	--
Dichloromethane (Methylene chlo	2 / 25	8.0%	0.12	2.00	23	0.070	14.0	5	11	5	0	1	4.0%	--
Ethyl benzene	1 / 25	4.0%	0.060	0.060	24	0.050	12.0	700	1.5	1.5	0	8	32.0%	P
Isopropylbenzene	0 / 25	0%	ND	ND	25	0.050	10.0	--	45	45	0	0	0%	--
m&p-Xylene	0 / 25	0%	ND	ND	25	0.10	20	10000	19	19	0	1	4.0%	--
n-Butylbenzene	0 / 25	0%	ND	ND	25	0.050	10.0	--	100	100	0	0	0%	--
n-Propylbenzene	0 / 25	0%	ND	ND	25	0.054	12.0	--	66	66	0	0	0%	--
o-Xylene	0 / 25	0%	ND	ND	25	0.050	10.0	--	19	19	0	0	0%	--
p-Isopropyltoluene	0 / 25	0%	ND	ND	25	0.050	10.0	1000	110	110	0	0	0%	--
sec-Butylbenzene	0 / 25	0%	ND	ND	25	0.060	12.0	--	200	200	0	0	0%	--
Styrene	0 / 25	0%	ND	ND	25	0.050	10.0	100	120	100	0	0	0%	--
tert-Butylbenzene	0 / 25	0%	ND	ND	25	0.059	14.0	--	69	69	0	0	0%	--
Tetrachloroethene	0 / 25	0%	ND	ND	25	0.060	12.0	5	4.1	4.1	0	1	4.0%	--

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COPC: Constituent of Potentail Concern
P: Potentail COPC

Table 2.
COPC Selection: Ebenezer Groundwater Exposure Unit

Parameter	Detection Frequency	% Detects	Minimum Detection	Maximum Detection	# ND	Minimum DL or ND	Maximum DL for ND	MCL	RSL-Tap	Screening Level	# Detects Above Screening Level	#ND-DL Above Screening Level	% ND-DL above Screening Level	Status
Toluene	3 / 25	12.0%	0.090	2.20	22	0.070	14.0	1000	110	110	0	0	0%	--
trans-1,2-Dichloroethene	0 / 25	0%	ND	ND	25	0.060	12.0	100	36	36	0	0	0%	--
trans-1,3-Dichloropropene	0 / 25	0%	ND	ND	25	0.060	12.0	--	0.47	0.47	0	13	52.0%	P
Trichloroethene	0 / 25	0%	ND	ND	25	0.060	12.0	5	0.28	0.28	0	19	76.0%	P
Trichlorofluoromethane	0 / 25	0%	ND	ND	25	0.050	10.0	--	520	520	0	0	0%	--
Vinyl chloride	0 / 25	0%	ND	ND	25	0.075	20	2	0.019	0.019	0	25	100.0%	P

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P: Potentail COPC

Table 3.
COPC Selection: CBA Soil (0-2 ft-bgs)

Parameter	Detection Frequency	% Detection	Minimum Detection	Maximum Detection	# ND	Minimum DL for ND	Maximum DL for ND	RSL	Detected > RSL?	#Detects>RSL	If ND: % ND DLs > RSL	%ND >5%	Status
Inorganics													
Arsenic	0/8	0%	--	--	8	1.90	2.00	0.68	--	0	100%	Yes	P
Barium	8/8	100%	4.90	12.9	0	--	--	1500	--	0	--	--	--
Cadmium	0/8	0%	--	--	8	0.09	0.10	7.1	--	0	0%	--	--
Chromium	8/8	100%	2.60	4.00	0	--	--	0.3	Yes	8	--	--	COPC
Lead	14/14	100%	2.50	407	0	--	--	400	Yes	1	--	--	COPC
Mercury	13/14	92.9%	0.02	39.8	1	0.60	0.60	1.1	Yes	6	--	--	COPC
Selenium	0/8	0%	--	--	8	3.70	3.90	39	--	0	0%	--	--
Silver	0/8	0%	--	--	8	0.50	0.50	39	--	0	0%	--	--
PCB													
Aroclor-1016	0/14	0%	--	--	14	0.02	110	0.41	--	0	42.9%	Yes	P
Aroclor-1221	0/14	0%	--	--	14	0.01	110	0.2	--	0	42.9%	Yes	P
Aroclor-1232	0/14	0%	--	--	14	0.02	110	0.17	--	0	42.9%	Yes	P
Aroclor-1242	0/14	0%	--	--	14	0.01	110	0.23	--	0	42.9%	Yes	P
Aroclor-1248	0/14	0%	--	--	14	0.007	110	0.23	--	0	42.9%	Yes	P
Aroclor-1254	1/14	7.1%	0.14	0.14	13	0.009	110	0.12	Yes	1	--	--	COPC
Aroclor-1260	1/14	7.1%	0.20	0.20	13	0.01	110	0.24	--	0	--	--	--
Aroclor-1268	8/14	57.1%	0.10	350	6	0.007	2.39	0.12	Yes	7	--	--	COPC
SVOC													
1,2-Dichlorobenzene	0/1	0%	--	--	1	0.06	0.06	180	--	0	0%	--	--
1,3-Dichlorobenzene	0/1	0%	--	--	1	0.06	0.06	180	--	0	0%	--	--
1,4-Dichlorobenzene	0/1	0%	--	--	1	0.06	0.06	2.6	--	0	0%	--	--
1-Methyl Naphthalene	0/1	0	--	--	1	0.36	0.36	18	--	0	0	--	--
2-Methylnaphthalene	0/1	0%	--	--	1	0.36	0.36	24	--	0	0%	--	--
Acenaphthene	0/1	0%	--	--	1	0.36	0.36	360	--	0	0%	--	--
Acenaphthylene	0/1	0%	--	--	1	0.36	0.36	180	--	0	0%	--	--
Anthracene	0/1	0%	--	--	1	0.36	0.36	1800	--	0	0%	--	--
Benzo(a)anthracene	0/1	0%	--	--	1	0.36	0.36	1.1	--	0	0%	--	--
Benzo(a)pyrene	1/1	100%	0.37	0.37	0	--	--	0.11	Yes	1	--	--	COPC
Benzo(b)fluoranthene	0/1	0%	--	--	1	0.36	0.36	1.1	--	0	0%	--	--
Benzo(g,h,i)perylene	1/1	100%	0.76	0.76	0	--	--	180	--	0	--	--	--
Benzo(k)fluoranthene	0/1	0	--	--	1	0.36	0.36	11	--	0	0	--	--
Chrysene	0/1	0%	--	--	1	0.36	0.36	110	--	0	0%	--	--
Dibenzo(a,h)anthracene	0/1	0%	--	--	1	0.36	0.36	0.11	--	0	100%	Yes	P
Fluoranthene	0/1	0%	--	--	1	0.36	0.36	240	--	0	0%	--	--
Fluorene	0/1	0%	--	--	1	0.36	0.36	240	--	0	0%	--	--
Indeno(1,2,3-cd)pyrene	1/1	100%	0.38	0.38	0	--	--	1.1	--	0	--	--	--
Naphthalene	0/1	0%	--	--	1	0.36	0.36	3.8	--	0	0%	--	--
Phenanthrene	0/1	0%	--	--	1	0.36	0.36	180	--	0	0%	--	--
Pyrene	1/1	100%	0.61	0.61	0	--	--	180	--	0	--	--	--
VOC													
1,1,1-Trichloroethane	0/1	0%	--	--	1	0.06	0.06	810	--	0	0%	--	--
1,1,2,2-Tetrachloroethane	0/1	0%	--	--	1	0.06	0.06	0.6	--	0	0%	--	--
1,1,2-Trichloroethane	0/1	0%	--	--	1	0.06	0.06	0.15	--	0	0%	--	--
1,1-Dichloroethane	0/1	0%	--	--	1	0.06	0.06	3.6	--	0	0%	--	--
1,1-Dichloroethene	0/1	0%	--	--	1	0.06	0.06	23	--	0	0%	--	--
1,2,4-Trimethylbenzene	0/1	0%	--	--	1	0.06	0.06	30	--	0	0%	--	--
1,2-Dichloroethane	0/1	0%	--	--	1	0.06	0.06	0.46	--	0	0%	--	--
1,2-Dichloropropane	0/1	0%	--	--	1	0.06	0.06	1.6	--	0	0%	--	--
1,3,5-Trimethylbenzene	0/1	0%	--	--	1	0.06	0.06	27	--	0	0%	--	--
2-Chloroethyl vinyl ether	0/1	0%	--	--	1	0.06	0.06	0	--	0	--	--	--
Benzene	0/1	0%	--	--	1	0.06	0.06	1.2	--	0	0%	--	--
Bromodichloromethane	0/1	0%	--	--	1	0.06	0.06	0.29	--	0	0%	--	--
Bromoform	0/1	0%	--	--	1	0.06	0.06	19	--	0	0%	--	--
Bromomethane	0/1	0%	--	--	1	0.06	0.06	0.68	--	0	0%	--	--

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NA: Not Available

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P: Potentail COPC

Table 3.
COPC Selection: CBA Soil (0-2 ft-bgs)

Parameter	Detection Frequency	% Detection	Minimum Detection	Maximum Detection	# ND	Minimum DL for ND	Maximum DL for ND	RSL	Detected > RSL?	#Detects>RSL	If ND: % ND DLs > RSL	%ND >5%	Status
Carbon tetrachloride	0/1	0%	--	--	1	0.06	0.06	0.65	--	0	0%	--	--
Chlorobenzene	0/1	0%	--	--	1	0.06	0.06	28	--	0	0%	--	--
Chloroethane	0/1	0%	--	--	1	0.06	0.06	1400	--	0	0%	--	--
Chloroform	0/1	0%	--	--	1	0.06	0.06	0.32	--	0	0%	--	--
Chloromethane	0/1	0%	--	--	1	0.06	0.06	11	--	0	0%	--	--
cis-1,2-Dichloroethene	0/1	0%	--	--	1	0.06	0.06	16	--	0	0%	--	--
cis-1,3-Dichloropropene	0/1	0%	--	--	1	0.06	0.06	NA	--	0	--	--	--
Dibromochloromethane	0/1	0%	--	--	1	0.06	0.06	8.3	--	0	0%	--	--
Dichlorodifluoromethane	0/1	0%	--	--	1	0.06	0.06	8.7	--	0	0%	--	--
Dichloromethane (Methylene chloride)	0/1	0%	--	--	1	0.06	0.06	35	--	0	0%	--	--
Ethyl benzene	0/1	0%	--	--	1	0.06	0.06	5.8	--	0	0%	--	--
Isopropylbenzene	0/1	0%	--	--	1	0.06	0.06	190	--	0	0%	--	--
m&p-Xylene	0/1	0%	--	--	1	0.06	0.06	55	--	0	0%	--	--
n-Butylbenzene	0/1	0%	--	--	1	0.06	0.06	390	--	0	0%	--	--
n-Propylbenzene	0/1	0%	--	--	1	0.06	0.06	380	--	0	0%	--	--
o-Xylene	0/1	0%	--	--	1	0.06	0.06	65	--	0	0%	--	--
p-Isopropyltoluene	0/1	0%	--	--	1	0.06	0.06	490	--	0	0%	--	--
sec-Butylbenzene	0/1	0%	--	--	1	0.06	0.06	780	--	0	0%	--	--
Styrene	0/1	0%	--	--	1	0.06	0.06	600	--	0	0%	--	--
tert-Butylbenzene	0/1	0%	--	--	1	0.06	0.06	780	--	0	0%	--	--
Tetrachloroethene	0/1	0%	--	--	1	0.06	0.06	8.1	--	0	0%	--	--
Toluene	0/1	0%	--	--	1	0.06	0.06	490	--	0	0%	--	--
trans-1,2-Dichloroethene	0/1	0%	--	--	1	0.06	0.06	160	--	0	0%	--	--
trans-1,3-Dichloropropene	0/1	0%	--	--	1	0.06	0.06	1.7	--	0	0%	--	--
Trichloroethene	0/1	0%	--	--	1	0.06	0.06	0.41	--	0	0%	--	--
Trichlorofluoromethane	0/1	0%	--	--	1	0.06	0.06	2300	--	0	0%	--	--
Vinyl chloride	0/1	0%	--	--	1	0.06	0.06	0.059	--	0	100%	Yes	P

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Table 4.
COPC Selection: CBA Soil (0-5 ft-bgs)

Parameter	Detection Frequency	% Detection	Minimum Detection	Maximum Detection	# ND	Minimum DL for ND	Maximum DL for ND	RSL	Detected > RSL?	#Detects>RSL	If ND: % ND DLs > RSL	%ND >5%	Status
Inorganics													
Aluminum	5/5	100%	1,300	130,000	0	--	--	7700	Yes	1	--	--	COPC
Antimony	0/5	0%	--	--	5	0.006	130	3.1	--	0	40.0%	Yes	P
Arsenic	1/13	7.7%	0.41	0.41	12	0.44	283	0.68	--	0	--	--	--
Barium	13/13	100%	3.54	1,870	0	--	--	1500	Yes	1	--	--	COPC
Beryllium	0/5	0%	--	--	5	0.0001	4.35	16	--	0	0%	--	--
Cadmium	0/13	0%	--	--	13	0.0003	8.70	7.1	--	0	7.7%	Yes	P
Chromium	13/13	100%	1.14	261	0	--	--	0.3	Yes	13	--	--	COPC
Cobalt	3/5	60.0%	0.19	174	2	0.001	2.00	2.3	Yes	1	--	--	COPC
Copper	5/5	100%	3.38	696	0	--	--	310	Yes	1	--	--	COPC
Iron	5/5	100%	514	261,000	0	--	--	5500	Yes	2	--	--	COPC
Lead	23/24	95.8%	2.30	3,040	1	11.6	11.6	400	Yes	2	--	--	COPC
Mercury	76/78	97.4%	0.02	3,700	2	0.60	0.66	1.1	Yes	65	--	--	COPC
Molybdenum	0/1	0%	--	--	1	2.00	2.00	39	--	0	0%	--	--
Nickel	5/5	100%	0.39	261	0	--	--	150	Yes	1	--	--	COPC
Selenium	0/13	0%	--	--	13	0.006	113	39	--	0	7.7%	Yes	P
Silver	2/13	15.4%	0.19	87	11	0.0006	2.00	39	Yes	1	--	--	COPC
Strontium	1/1	100%	250	250	0	--	--	4700	--	0	--	--	--
Thallium	0/5	0%	--	--	5	0.0002	200	0.078	--	0	80.0%	Yes	P
Tin	0/1	0%	--	--	1	6.00	6.00	4700	--	0	0%	--	--
Vanadium	5/5	100%	0.90	435	0	--	--	39	Yes	1	--	--	COPC
Zinc	5/5	100%	3.26	3,000	0	--	--	2300	Yes	1	--	--	COPC
PCB													
Aroclor-1016	0/29	0%	--	--	29	0.02	110	0.41	--	0	44.8%	Yes	P
Aroclor-1221	0/29	0%	--	--	29	0.01	110	0.2	--	0	62.1%	Yes	P
Aroclor-1232	0/29	0%	--	--	29	0.02	110	0.17	--	0	72.4%	Yes	P
Aroclor-1242	0/29	0%	--	--	29	0.01	110	0.23	--	0	51.7%	Yes	P
Aroclor-1248	0/29	0%	--	--	29	0.007	110	0.23	--	0	51.7%	Yes	P
Aroclor-1254	7/29	24.1%	0.14	348	22	0.009	110	0.12	Yes	7	--	--	COPC
Aroclor-1260	4/29	13.8%	0.20	1.30	25	0.01	110	0.24	Yes	3	--	--	COPC
Aroclor-1268	18/30	60.0%	0.10	478	12	0.007	2.66	0.12	Yes	17	--	--	COPC
SVOC													
1,2,4-Trichlorobenzene	0/5	0%	--	--	5	6.60	14.3	5.8	--	0	100%	Yes	P
1,2-Dichlorobenzene	0/5	0%	--	--	5	0.05	14.3	180	--	0	0%	--	--
1,3-Dichlorobenzene	0/5	0%	--	--	5	0.05	14.3	180	--	0	0%	--	--
1,4-Dichlorobenzene	0/5	0%	--	--	5	0.05	14.3	2.6	--	0	20.0%	Yes	P
1-Methyl Naphthalene	1/3	33.3%	0.008	0.008	2	0.005	0.36	18	--	0	--	--	--
2,2'-Chloroisopropylether	0/4	0%	--	--	4	6.60	8.90	NA	--	0	--	--	--
2,2'-Oxybis(1-Chloropropane)	0/1	0%	--	--	1	14.3	14.3	310	--	0	0%	--	--
2,3,4,6-Tetrachlorophenol	0/4	0%	--	--	4	6.60	8.90	190	--	0	0%	--	--
2,4,5-Trichlorophenol	0/5	0%	--	--	5	6.60	14.3	630	--	0	0%	--	--
2,4,6-Trichlorophenol	0/5	0%	--	--	5	6.60	14.3	6.3	--	0	100%	Yes	P
2,4-Dichlorophenol	0/5	0%	--	--	5	6.60	14.3	19	--	0	0%	--	--
2,4-Dimethylphenol	0/5	0%	--	--	5	6.60	14.3	130	--	0	0%	--	--
2,4-Dinitrophenol	0/5	0%	--	--	5	13.0	72	13	--	0	60.0%	Yes	P
2,6-Dinitrotoluene	0/5	0%	--	--	5	6.60	14.3	0.36	--	0	100%	Yes	P
2-Chloronaphthalene	0/5	0%	--	--	5	6.60	14.3	480	--	0	0%	--	--
2-Chlorophenol	0/5	0%	--	--	5	6.60	14.3	39	--	0	0%	--	--
2-Methylnaphthalene	1/8	12.5%	0.01	0.01	7	0.006	14.3	24	--	0	--	--	--
2-Methylphenol	0/5	0%	--	--	5	6.60	14.3	320	--	0	0%	--	--
2-Nitroaniline	0/5	0%	--	--	5	6.60	14.3	63	--	0	0%	--	--
2-Nitrophenol	0/5	0%	--	--	5	6.60	28.7	13	--	0	20.0%	Yes	P
3,3'-Dichlorobenzidine	0/5	0%	--	--	5	6.60	28.7	1.2	--	0	100%	Yes	P
3/4-Methylphenol	0/4	0%	--	--	4	6.60	8.90	3100	--	0	0%	--	--
3-Nitroaniline	0/5	0%	--	--	5	6.60	14.3	610	--	0	0%	--	--

Units: mg/kg (milligrams per kilogram)
ND: non-detect
RSL: Regional SCreening Level, Residential
NA: Not Available

COPC: Constituent of Potentail Concern
P: Potentail COPC

Table 4.
COPC Selection: CBA Soil (0-5 ft-bgs)

Parameter	Detection Frequency	% Detection	Minimum Detection	Maximum Detection	# ND	Minimum DL for ND	Maximum DL for ND	RSL	Detected > RSL?	#Detects>RSL	If ND: % ND DLs > RSL	%ND >5%	Status
4,6-Dinitro-2-methylphenol	0/5	0%	--	--	5	13.0	72	0.51	--	0	100%	Yes	P
4-Bromophenyl-phenylether	0/5	0%	--	--	5	6.60	14.3	NA	--	0	--	--	--
4-Chloro-3-methylphenol	0/5	0%	--	--	5	6.60	28.7	630	--	0	0%	--	--
4-Chloroaniline	0/5	0%	--	--	5	6.60	14.3	2.7	--	0	100%	Yes	P
4-Chlorophenyl-phenylether	0/5	0%	--	--	5	6.60	14.3	32	--	0	0%	--	--
4-Methylphenol	0/1	0%	--	--	1	14.3	14.3	310	--	0	0%	--	--
4-Nitroaniline	0/5	0%	--	--	5	6.60	14.3	25	--	0	0%	--	--
4-Nitrophenol	0/5	0%	--	--	5	13.0	72	13	--	0	60.0%	Yes	P
Acenaphthene	0/8	0%	--	--	8	0.005	14.3	360	--	0	0%	--	--
Acenaphthylene	0/8	0%	--	--	8	0.005	14.3	180	--	0	0%	--	--
Aniline	0/1	0%	--	--	1	14.3	14.3	44	--	0	0%	--	--
Anthracene	2/8	25.0%	0.01	18.3	6	0.006	8.90	1800	--	0	--	--	--
Benzidine	0/1	0%	--	--	1	115	115	0.00053	--	0	100%	Yes	P
Benzo(a)anthracene	4/8	50.0%	0.02	37.0	4	0.36	8.90	1.1	Yes	1	--	--	COPC
Benzo(a)pyrene	4/8	50.0%	0.02	42.6	4	6.60	8.90	0.11	Yes	2	--	--	COPC
Benzo(b)fluoranthene	3/4	75.0%	0.02	43.5	1	0.36	0.36	1.1	Yes	1	--	--	COPC
Benzo(b/k)fluoranthene	1/4	25.0%	1.30	1.30	3	6.60	8.90	1.1	Yes	1	--	--	COPC
Benzo(g,h,i)perylene	4/8	50.0%	0.04	35.2	4	6.60	8.90	180	--	0	--	--	--
Benzo(k)fluoranthene	3/4	75.0%	0.01	49.6	1	0.36	0.36	11	Yes	1	--	--	COPC
Benzoic acid	0/1	0%	--	--	1	72	72	25000	--	0	0%	--	--
Benzyl alcohol	0/1	0%	--	--	1	14.3	14.3	630	--	0	0%	--	--
bis(2-Chloroethoxy) methane	0/5	0%	--	--	5	6.60	14.3	19	--	0	0%	--	--
bis(2-Chloroethyl) ether	0/5	0%	--	--	5	6.60	14.3	0.23	--	0	100%	Yes	P
bis(2-Ethylhexyl) phthalate	0/5	0%	--	--	5	6.60	14.3	39	--	0	0%	--	--
Butylbenzylphthalate	0/5	0%	--	--	5	6.60	14.3	290	--	0	0%	--	--
Carbazole	0/4	0%	--	--	4	6.60	8.90	NA	--	0	--	--	--
Chrysene	3/8	37.5%	0.02	54	5	0.36	8.90	110	--	0	--	--	--
Cyclohexanone	0/3	0%	--	--	3	6.60	8.90	2800	--	0	0%	--	--
Dibenzo(a,h)anthracene	2/8	25.0%	0.01	0.02	6	0.36	14.3	0.11	--	0	--	--	--
Dibenzofuran	0/7	0%	--	--	7	0.003	14.3	7.3	--	0	42.9%	Yes	P
Diethylphthalate	0/5	0%	--	--	5	6.60	14.3	5100	--	0	0%	--	--
Dimethylphthalate	0/5	0%	--	--	5	6.60	14.3	NA	--	0	--	--	--
Di-n-butylphthalate	0/5	0%	--	--	5	6.60	14.3	630	--	0	0%	--	--
Di-n-octylphthalate	0/5	0%	--	--	5	6.60	14.3	63	--	0	0%	--	--
Fluoranthene	4/8	50.0%	0.02	74	4	0.36	8.90	240	--	0	--	--	--
Fluorene	0/8	0%	--	--	8	0.006	14.3	240	--	0	0%	--	--
Hexachlorobenzene	0/5	0%	--	--	5	6.60	14.3	0.21	--	0	100%	Yes	P
Hexachlorobutadiene	0/5	0%	--	--	5	6.60	14.3	1.2	--	0	100%	Yes	P
Hexachlorocyclopentadiene	0/5	0%	--	--	5	6.60	14.3	0.18	--	0	100%	Yes	P
Hexachloroethane	0/5	0%	--	--	5	6.60	14.3	1.8	--	0	100%	Yes	P
Indeno(1,2,3-cd)pyrene	4/8	50.0%	0.02	26.5	4	6.60	8.90	1.1	Yes	1	--	--	COPC
Isophorone	0/5	0%	--	--	5	6.60	14.3	570	--	0	0%	--	--
Naphthalene	1/8	12.5%	0.007	0.007	7	0.005	14.3	3.8	--	0	--	--	--
Nitrobenzene	0/5	0%	--	--	5	6.60	14.3	5.1	--	0	100%	Yes	P
N-Nitrosodimethylamine	0/1	0%	--	--	1	14.3	14.3	0.002	--	0	100%	Yes	P
N-Nitroso-di-n-propylamine	0/5	0%	--	--	5	6.60	14.3	0.078	--	0	100%	Yes	P
N-Nitrosodiphenylamine/Diphenylamine	0/5	0%	--	--	5	6.60	14.3	110	--	0	0%	--	--
Pentachlorophenol	0/5	0%	--	--	5	13.0	72	1	--	0	100%	Yes	P
Phenanthrene	3/8	37.5%	0.02	61	5	0.36	8.90	180	--	0	--	--	--
Phenol	0/5	0%	--	--	5	6.60	14.3	1900	--	0	0%	--	--
Pyrene	5/8	62.5%	0.03	60	3	6.60	8.90	180	--	0	--	--	--
Pyridine	0/3	0%	--	--	3	6.60	8.90	7.8	--	0	33.3%	Yes	P
VOC													
1,1,1,2-Tetrachloroethane	0/2	0%	--	--	2	0.06	0.22	2	--	0	0%	--	--
1,1,1-Trichloroethane	0/5	0%	--	--	5	0.05	0.22	810	--	0	0%	--	--

Units: mg/kg (milligrams per kilogram)
ND: non-detect
RSL: Regional SCreening Level, Residential
NA: Not Available

COPC: Constituent of Potentail Concern
P: Potentail COPC

Table 4.
COPC Selection: CBA Soil (0-5 ft-bgs)

Parameter	Detection Frequency	% Detection	Minimum Detection	Maximum Detection	# ND	Minimum DL for ND	Maximum DL for ND	RSL	Detected > RSL?	#Detects>RSL	If ND: % ND DLs > RSL	%ND >5%	Status
1,1,2,2-Tetrachloroethane	0/5	0%	--	--	5	0.05	0.22	0.6	--	0	0%	--	--
1,1,2-Trichloroethane	0/5	0%	--	--	5	0.05	0.22	0.15	--	0	20.0%	Yes	P
1,1-Dichloroethane	0/5	0%	--	--	5	0.05	0.22	3.6	--	0	0%	--	--
1,1-Dichloroethene	0/5	0%	--	--	5	0.05	0.22	23	--	0	0%	--	--
1,1-Dichloropropene	0/4	0%	--	--	4	0.05	0.22	1.8	--	0	0%	--	--
1,2,3-Trichlorobenzene	0/1	0%	--	--	1	0.22	0.22	6.3	--	0	0%	--	--
1,2,3-Trichloropropane	0/4	0%	--	--	4	0.05	0.22	0.0051	--	0	100%	Yes	P
1,2,4-Trimethylbenzene	0/2	0%	--	--	2	0.06	0.22	30	--	0	0%	--	--
1,2-Dibromo-3-chloropropane	0/1	0%	--	--	1	0.22	0.22	0.0053	--	0	100%	Yes	P
1,2-Dibromoethane	0/1	0%	--	--	1	0.22	0.22	0.036	--	0	100%	Yes	P
1,2-Dichloroethane	0/5	0%	--	--	5	0.05	0.22	0.46	--	0	0%	--	--
1,2-Dichloropropane	0/5	0%	--	--	5	0.05	0.22	1.6	--	0	0%	--	--
1,3,5-Trimethylbenzene	0/2	0%	--	--	2	0.06	0.22	27	--	0	0%	--	--
1,3-Dichloropropane	0/4	0%	--	--	4	0.05	0.22	160	--	0	0%	--	--
2,2-Dichloropropane	0/4	0%	--	--	4	0.05	0.22	160	--	0	0%	--	--
2-Butanone (MEK)	0/3	0%	--	--	3	0.54	0.64	2700	--	0	0%	--	--
2-Chloroethyl vinyl ether	0/1	0%	--	--	1	0.06	0.06	NA	--	0	--	--	--
2-Chlorotoluene	0/4	0%	--	--	4	0.05	0.22	160	--	0	0%	--	--
2-Hexanone	0/4	0%	--	--	4	0.14	0.44	20	--	0	0%	--	--
4-Chlorotoluene	0/4	0%	--	--	4	0.05	0.22	160	--	0	0%	--	--
4-Methyl-2-pentanone	0/4	0%	--	--	4	0.14	0.44	3300	--	0	0%	--	--
Acetone	0/3	0%	--	--	3	0.54	0.64	6100	--	0	0%	--	--
Acrylonitrile	0/1	0%	--	--	1	0.22	0.22	0.25	--	0	0%	--	--
Benzene	0/5	0%	--	--	5	0.05	0.22	1.2	--	0	0%	--	--
Bromobenzene	0/4	0%	--	--	4	0.05	0.22	29	--	0	0%	--	--
Bromochloromethane	0/4	0%	--	--	4	0.05	0.22	15	--	0	0%	--	--
Bromodichloromethane	0/5	0%	--	--	5	0.05	0.22	0.29	--	0	0%	--	--
Bromoform	0/5	0%	--	--	5	0.05	0.22	19	--	0	0%	--	--
Bromomethane	0/5	0%	--	--	5	0.05	0.44	0.68	--	0	0%	--	--
Carbon disulfide	0/4	0%	--	--	4	0.14	0.22	77	--	0	0%	--	--
Carbon tetrachloride	0/5	0%	--	--	5	0.05	0.22	0.65	--	0	0%	--	--
Chlorobenzene	0/5	0%	--	--	5	0.05	0.22	28	--	0	0%	--	--
Chloroethane	0/5	0%	--	--	5	0.05	0.22	1400	--	0	0%	--	--
Chloroform	0/5	0%	--	--	5	0.05	0.22	0.32	--	0	0%	--	--
Chloromethane	0/5	0%	--	--	5	0.05	0.44	11	--	0	0%	--	--
cis-1,2-Dichloroethene	0/5	0%	--	--	5	0.05	0.22	16	--	0	0%	--	--
cis-1,3-Dichloropropene	0/5	0%	--	--	5	0.05	0.22	NA	--	0	--	--	--
Dibromochloromethane	0/5	0%	--	--	5	0.05	0.22	8.3	--	0	0%	--	--
Dibromomethane	0/4	0%	--	--	4	0.05	0.22	2.4	--	0	0%	--	--
Dichlorodifluoromethane	0/2	0%	--	--	2	0.06	0.44	8.7	--	0	0%	--	--
Dichloromethane (Methylene chloride)	0/5	0%	--	--	5	0.05	0.44	35	--	0	0%	--	--
Ethyl benzene	0/5	0%	--	--	5	0.05	0.22	5.8	--	0	0%	--	--
Isopropylbenzene	0/2	0%	--	--	2	0.06	0.22	190	--	0	0%	--	--
m&p-Xylene	0/1	0%	--	--	1	0.06	0.06	55	--	0	0%	--	--
n-Butylbenzene	0/2	0%	--	--	2	0.06	0.22	390	--	0	0%	--	--
n-Propylbenzene	0/2	0%	--	--	2	0.06	0.22	380	--	0	0%	--	--
o-Xylene	0/4	0%	--	--	4	0.05	0.06	65	--	0	0%	--	--
p-Isopropyltoluene	0/2	0%	--	--	2	0.06	0.22	490	--	0	0%	--	--
sec-Butylbenzene	0/2	0%	--	--	2	0.06	0.22	780	--	0	0%	--	--
Styrene	0/5	0%	--	--	5	0.05	0.22	600	--	0	0%	--	--
tert-Butylbenzene	0/2	0%	--	--	2	0.06	0.22	780	--	0	0%	--	--
Tetrachloroethene	0/5	0%	--	--	5	0.05	0.22	8.1	--	0	0%	--	--
Toluene	0/5	0%	--	--	5	0.05	0.22	490	--	0	0%	--	--
trans-1,2-Dichloroethene	0/5	0%	--	--	5	0.05	0.22	160	--	0	0%	--	--
trans-1,3-Dichloropropene	0/5	0%	--	--	5	0.05	0.22	1.7	--	0	0%	--	--

Units: mg/kg (milligrams per kilogram)
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NA: Not Available

COPC: Constituent of Potentail Concern
P: Potentail COPC

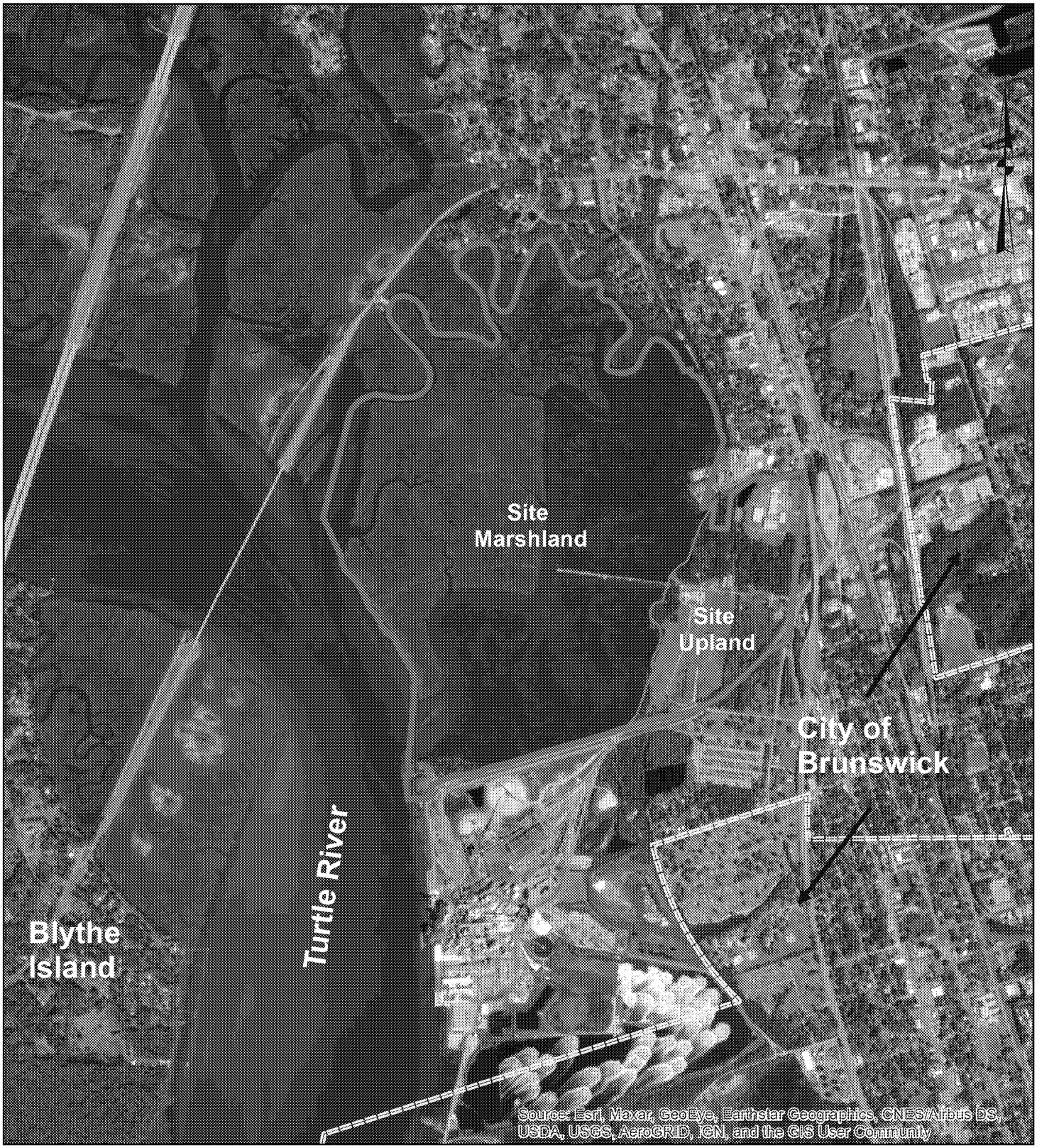
Table 4.
COPC Selection: CBA Soil (0-5 ft-bgs)

Parameter	Detection Frequency	% Detection	Minimum Detection	Maximum Detection	# ND	Minimum DL for ND	Maximum DL for ND	RSL	Detected > RSL?	#Detects>RSL	If ND: % ND DLs > RSL	%ND >5%	Status
Trichloroethene	0/5	0%	--	--	5	0.05	0.22	0.41	--	0	0%	--	--
Trichlorofluoromethane	0/5	0%	--	--	5	0.05	0.22	2300	--	0	0%	--	--
Vinyl chloride	0/5	0%	--	--	5	0.05	0.44	0.059	--	0	80.0%	Yes	P
Xylenes (unspecified)	0/4	0%	--	--	4	0.05	0.22	58	--	0	0%	--	--

Units: mg/kg (milligrams per kilogram)
ND: non-detect
RSL: Regional SCreening Level, Residential
NA: Not Available

COPC: Constituent of Potentail Concern
P: Potentail COPC

Figures



0 950 1,900 3,800

Feet

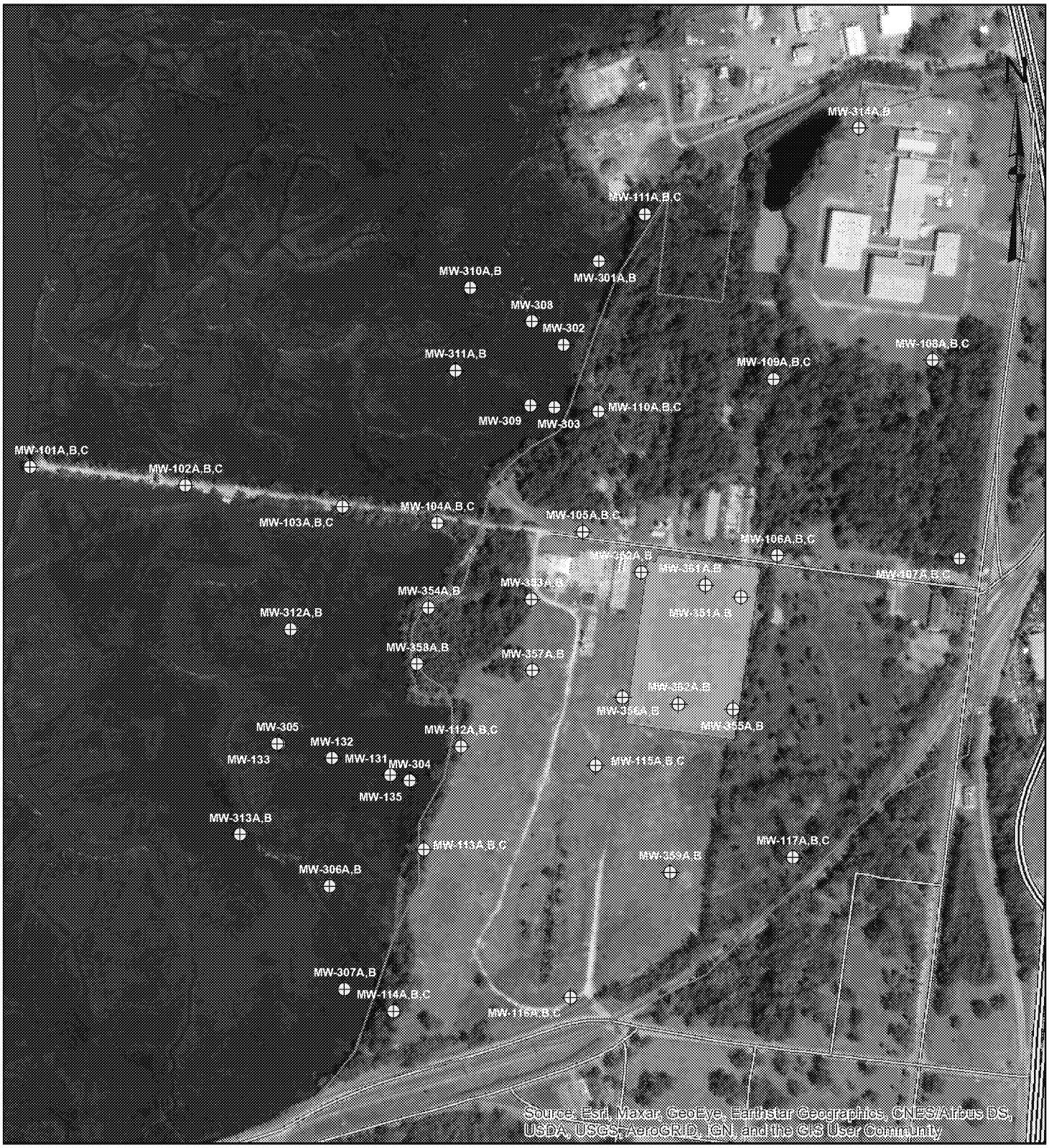
Site Features

- Site Upland Area
- Site Boundary
- Brunswick City Limit

Site Setting
LCP Chemicals Site
Brunswick, GA

Environmental Planning Specialists, Inc.

Figure No.1



0 250 500 1,000

Feet

Site Features

- Upland Boundary
- Cell Building Area Soil Cover

Monitoring Well Status

- Satilla Monitoring Wells

Satilla EU Monitoring Well Network LCP Chemicals Site Brunswick, GA

Environmental Planning Specialists, Inc.

Figure No.2

0 250 500 1,000

Feet

Ebenezer EU Monitoring Well Network LCP Chemicals Site Brunswick, GA

Site Features

- Upland Boundary
- Cell Building Area Soil Cover

Monitoring Well Status

- Ebenezer Verticle Monitoring Wells
- Ebenezer Horizontal Well

0 45 90 180
Feet

Site Features

Historical Site Feature

CBA Soil Cover and EU

Sample Depth Correction (ft)

No Change

< 1

1 - 2

2 - 3

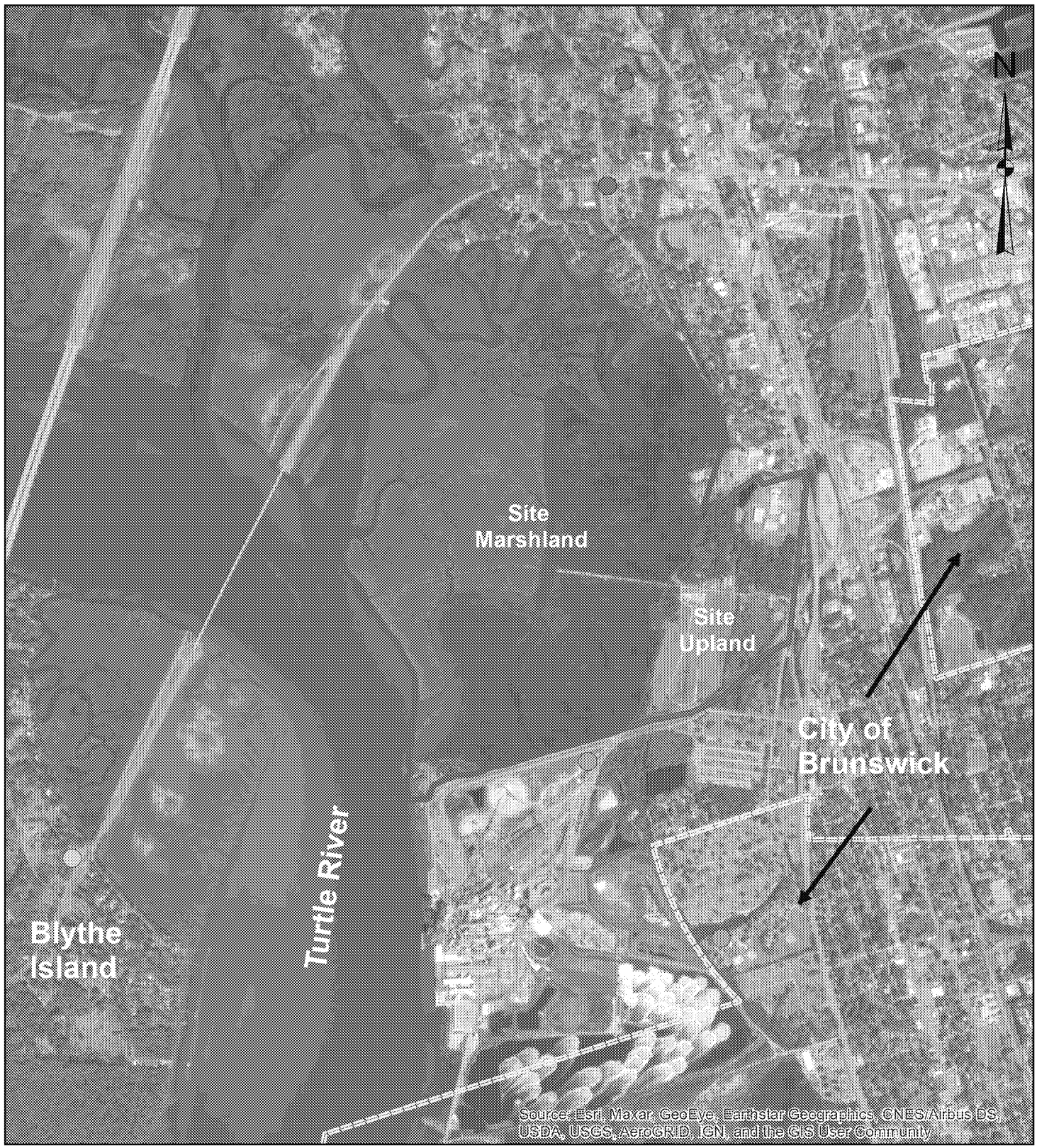
> 3

CBA Soil EU and Soil Cover Sample Depth Correction LCP Chemicals Site Brunswick, GA

Soil samples collected post 1997 (after soil cover construction) are not adjusted for the soil cover depth.

Environmental Planning Specialists, Inc.

Figure No.4



0 950 1,900 3,800

Feet

Area Water Wells
LCP Chemicals Site
Brunswick, GA

Site Features

- Site Upland Area
- Site Boundary
- Brunswick City Limit

Well Type

- Commercial
- Industrial
- Residential (Mobile Home Park)

Environmental Planning Specialists, Inc.

Figure No.5

Figure 6
Human Health Conceptual Site Model - OU2 Groundwater

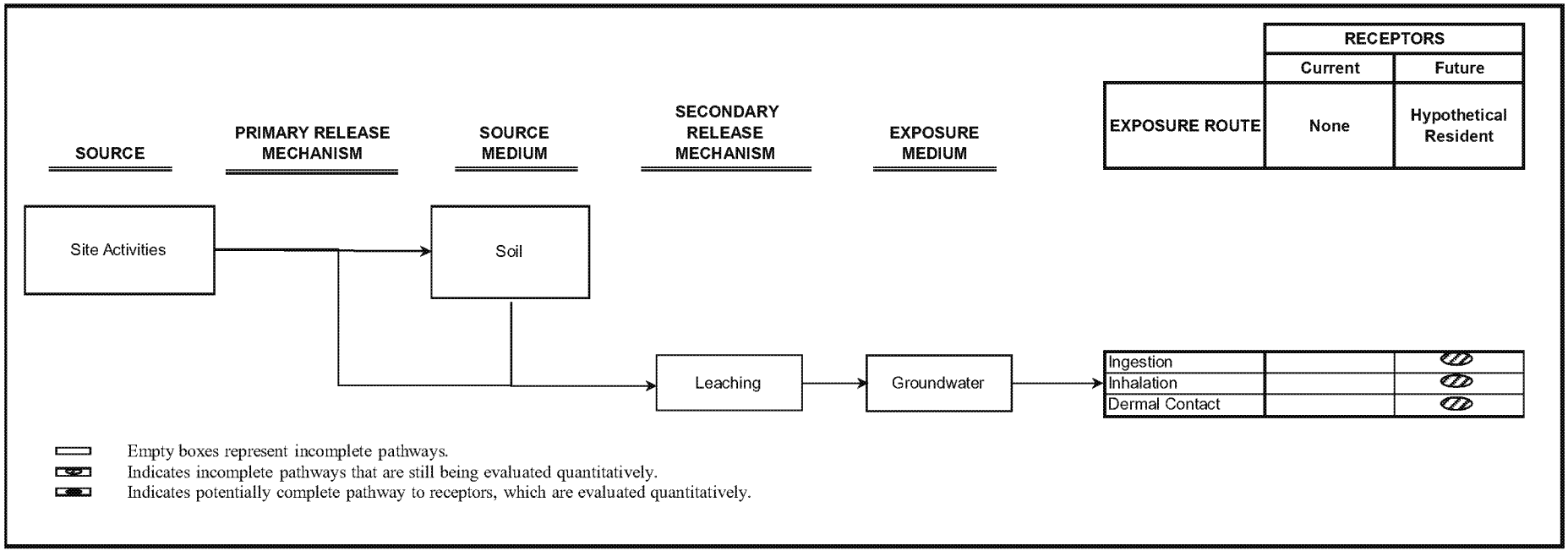
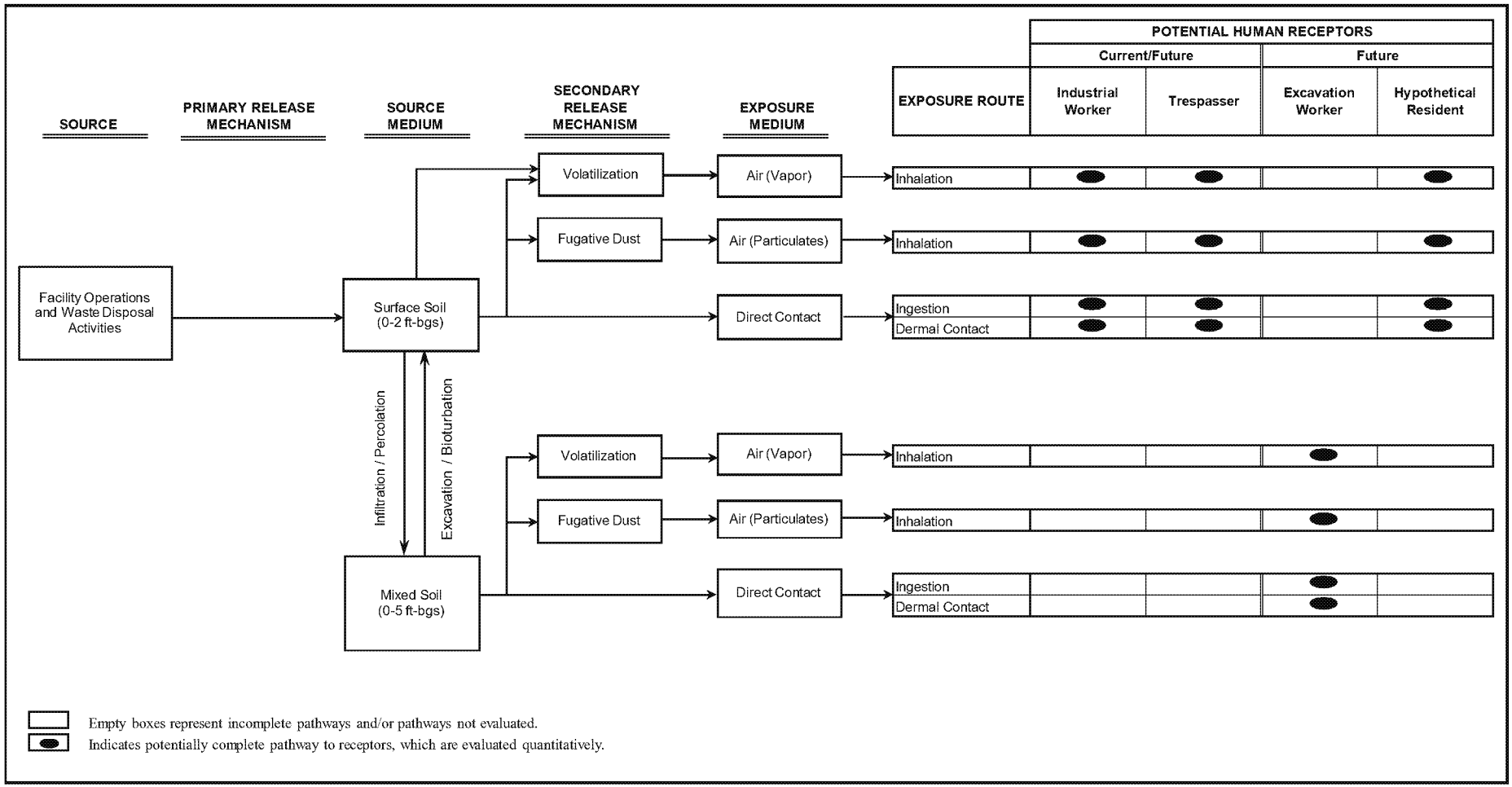


Figure 7
Human Health Conceptual Site Model - CBA Soil



Appendix A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

Ref: 4WD-SRB DEC 0 1 2009

Via Certified Mail

Mr. Prashant K. Gupta
Honeywell, Inc.
4101 Bermuda Hundred Road
Chester, VA 23836

Re: Operable Unit 3 (Uplands) Human Health Risk Assessment (HHRA): LCP Chemical National Priorities List Site, Brunswick, Glynn County, GA

Dear Mr. Gupta:

Through a February 24, 2009, letter, EPA commented on deficiencies found in the August 2008 draft of the referenced document. The HHRA was revised and resubmitted to EPA and received in these offices on March 29, 2009. Though a June 22, 2009 letter EPA provided comments on the March 2009 draft. During July through August 2009, a number of meetings were held to discuss the data set to be used in the HHRA. On September 8, 2009, a final meeting was held in these offices to discuss the data set, with an understanding that EPA and the Georgia Department of Environmental Protection (GaEPD) would jointly provide the provisional peer reviewed toxicity values (PPRTVs) for certain compounds. In addition, EPA was to provide surrogates for a number of analytes.

Enclosed is a table containing the final surrogates recommended by both GaEPD and EPA. I understand this is the final information required to revise the March 2009 draft of the OU3 HHRA.

Pursuant to Section VIII of the Administrative Order on Consent for RI/FS for the Site, EPA Docket No. 95-17-C (AOC for RI/FS), please submit the revised HHRA within thirty (30) calendar days of receipt of this letter.

Once both human health and ecological risk assessments are finalized and approved by EPA, I will request the submittal of the OU3 RI Report and the deliverable described under Task 6 (Development and Screening of Remedial Action Alternatives) of the Scope of Work for the RI/FS. EPA and GaEPD will review this submittal and, if necessary, comment on it before requesting the submittal of the Detailed Analysis of Remedial Action Alternatives (Task 7 of the Scope of Work for the RI/FS).

Should you have any questions regarding the preceding, please contact me at (404) 562-8937.

Sincerely,

Galo Jackson
Remedial Project Manager
South Superfund Remedial Branch

Enclosure

cc: J. McNamara, GaEPD

Parameter	Surrogate
1,1-Dichloropropene	1,3-Dichloropropene
1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene
2,2-Dichloropropane	1,3-dichloropropane
2-Hexanone	on IRIS (591-78-6)
2-Nitrophenol	2,4-Dinitrophenol
4-Chloro-3-methylphenol	2-Chlorophenol
4-Chlorophenyl-phenylether	Methoxychlor
4-Nitrophenol	2,4-Dinitrophenol
Acenaphthylene	Pyrene
Benzo(g,h,i)perylene	Pyrene
Bromochloromethane	Bromodichloromethane
delta-BHC (HCH)	alpha-BHC (HCH)
Endosulfan I	Endosulfan
Endosulfan II	Endosulfan
Endosulfan sulfate	Endosulfan
Endrin aldehyde	Endrin
Endrin ketone	Endrin
Phenanthrene	Pyrene
p-Isopropyltoluene	Toluene
2-Nitroaniline	listed in RSLT with PPRTV (CASN 88-74-4)
1,3-Dichlorobenzene	1,2-DCB
2,2'-Chloroisopropylether	No recommended surrogate
2,2'-Oxybis(1-Chloropropane)	No recommended surrogate
2-Chloroethyl vinyl ether	No recommended surrogate
3/4-Methylphenol	3-Methylphenol on IRIS
4-Bromophenyl-phenylether	No recommended surrogate
Dimethylphthalate	Screening subchronic reference dose = 0.1 mg/kg-d
Di-n-octylphthalate	No recommended surrogate
Hexadecenoic Acid	No recommended surrogate
Methylethylidene Bicyclooctane [edited spelling]	No recommended surrogate
n-Butylbenzene	Ethylbenzene
n-Propylbenzene	Ethylbenzene
Octahydrotrimethylmethylethylphenanthrenol	No recommended surrogate
sec-Butylbenzene	Cumene (isopropylbenzene)
Tellurium	No surrogate
tert-Butylbenzene	Cumene (isopropylbenzene)
Yttrium	No recommended surrogate
alpha-Chlordane	Chlordane
cis-1,3-Dichloropropene	1,3-Dichloropropene on IRIS (542-75-6)
Dibenzofuran	Screening chronic reference dose = 0.001 mg/kg-d
gamma-Chlordane	Chlordane
Titanium	No recommended surrogate
trans-1,3-Dichloropropene	1,3-Dichloropropene on IRIS (542-75-6)